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ANADROMOUS FISH EVALUATION PROGRAM
Fish Facility Design Review Work Group
Minutes
July 24 and 25, 2001

ATTENDEES:

Name	Organization
Martin Ahmann	U.S. Army Corps of Engineers (Corps)
Steve Anglea	Battelle Pacific Northwest Laboratory (Battelle)
Anneli Aston	Corps
Jim Bluhm	Corps
Jim Cain	Corps
Linda Carter	Corps
David Coleman	Corps
Kevin Crum	Corps
Rick Emmert	Corps
Carolyn Foote	Corps
Bill Hevlin	National Marine Fisheries Service (NMFS)
Fred Higginbotham	Corps
Rebecca Kalamasz	Corps
Dan Katz	Corps
Ed Kim	Corps
Mark Lindgren	Corps
Mike Mason	Corps
Sean Milligan	Corps
Paul Ocker	Corps
Charles Palmer	Corps
Chris Pinney	Corps
Cary Rahn	Corps
Steve Rainey	NMFS
Lynn Reese	Corps
Ann Setter	Oregon Department of Fish and Wildlife (ODFW)
Marvin Shutters	Corps
Mark Smith	Corps
Gene Spangrude	Corps
Larry Swenson	NMFS
Tim Wik	Corps
Tonia Elsey	Corps

The Fish Facility Design Review Work Group (FFDRWG) meeting was held in the Harvest Room on July 24 and 25, 2001, at the U.S. Army Corps of Engineers (Corps), Walla Walla District, 201 North Third Avenue, Walla Walla, Washington. Rebecca Kalamasz organized the meeting, and Tonia Elsey served

as note taker. The meeting was audio taped in order to facilitate completion of the minutes.

1. SPILL-RELATED MODIFICATIONS.

a. McNary Lock and Dam (McNary) Deflectors. Rick Emmert did not have a handout, but provided hard copies of his overhead slides for insertion into the minutes (handout 1). Rick discussed the contract schedule for deflectors and gate hoists at McNary. Deflector construction would be only on the four end bays. The contract was awarded to Aqua Terra Construction on July 19, 2001, with a bid of $1.25 million. Construction will be from October 15, 2001, through March 30, 2002. The contract for gate hoists was awarded on June 21, 2001, to Transco Industries with a bid of $1.62 million. Rick indicated the gate hoists would be in place by March 15, 2002. Rick discussed the estimated project costs for Fiscal Years (FY) 02, 03, and 04 (see handout 1).

Bill Hevlin asked if there were going to be biological testing. Rick Emmert indicated that there was biological testing but it was covered under a different spill (could not hear). Rebecca Kalamasz indicated biological testing was a separate line item on the Systems Configuration Team (SCT) list.

Steve Rainey asked if the Corps were looking at multiple walls in this phase. Rick Emmert stated that most of the focus was on the north shore ladder. In the work plan, they are looking at cut off walls for the powerhouse and (could not hear) was discussed. Steve Rainey indicated he was referring to the two walls, one being a pier extension and the other the shoreline wall. Rick Emmert stated those were included in the scope being worked on by Jim Cain. Steve Rainey asked if the $2.3 million included the two wall extensions. Rick Emmert stated he thought that was just for the one pier extension, and the numbers would have to be revised for the wall extensions. There was group discussion on the construction, costs, and model study of the deflectors. Bill Hevlin asked if the wall between end bays 1 and 2 would go all the way out to the end sill of the spillway. Rick Emmert stated it would. Bill Hevlin stated that the adult entrance was out there. Rick Emmert indicated that the adult entrance was north of spillbay 1. He also stated that putting the wall in would minimize an eddy. There was discussion on the eddy problems and the wall extensions. Rick Emmert assured everyone that all the information collected on the McNary deflector and gate hoist projects would be presented at all FFDRWG meetings as it was collected.

b. Little Goose Lock and Dam (Little Goose) Deflectors. Rick Emmert indicated the sectional model was complete and testing would be complete on the end bay deflectors design geometry by the end of the FY. The general model is under construction and is 80-percent complete. Upstream and downstream topography is complete. Water supply, tailgate, spillway, and gates are complete. The powerhouse is still under construction. The Corps hopes to be

done by the end of the FY. Sean Milligan is head of the model test plan. There was discussion on the development and approach of the testing. Rick Emmert stated that the Corps is reviewing the use of 12-foot deflectors. There was discussion on the advantages of longer deflectors. Steve Rainey asked if gas abatement would be included in the study or done separately. Rick Emmert stated the Corps had anticipated including it in the study plan. He stated that testing would be a two-phase approach. One approach would be the length and the other being placement of the wall. Rebecca Kalamasz asked what the long-term schedule for construction and/or discussion would be. Rick Emmert stated the Corps would like to get the model work done this fall and would have enough information to have plans and specifications ready by the 2002-03 winter work window. Rebecca Kalamasz asked if the Corps could forecast when a meeting could be held at Little Goose for the various organizations. Rick Emmert thought after Christmas. There was discussion on the different model testing.

c. Lower Monumental Lock and Dam (Lower Monumental) Deflectors/Erosion/Outfall. Dan Katz distributed handout 2. He gave a quick background update on the erosion problems at Lower Monumental. Phase 1 construction includes end bay deflectors and stilling basin repair. Money has been allocated for the next FY to repair the erosion in the stilling basin. The Corps will be working on plans and specification, as well as testing. Mark Smith asked what kind of repair would be done on the erosion. Dan Katz stated there would be a concrete fill poured in the existing erosion holes. Mark Smith asked if this fix were considered permanent or temporary. Dan Katz stated it was considered a permanent fix.

Rick Emmert stated that the funding for the deflectors is still coming from the Columbia River Fish Mitigation Program (CRFMP). If the deflectors are included in this contract, the funding needs to be ready next year. Dan Katz stated there would be one contract but two different funding sources, one for the stilling basin erosion repair and one for the deflectors. Steve Rainey stated his understanding was that the $5 or $7 million was through an operations and maintenance (O&M) conduit. He asked, since the deflectors are a CRFMP, if one contract would work with two funding sources, and if the costs that run over in FY 03 would come from O&M. Rick Emmert stated that the O&M funding would pay for the entire construction with the exception of (could not hear).

There was discussion on phase 2 of the construction (see handout 2). If any of the items in phase 2 are necessary, construction would be completed and normal operation would resume in the spring of 2004.

Dan Katz stated that in terms of the general model the Corps has continued verification of erosion patterns. The Corps has also added a particle tracking system to observe what is happening downstream, and the end bay deflector elevation needs to be verified. One concern on the sectional model was the stilling basin output. The Corps is concerned with verifying spill levels

and what they will do to the stability of the spilling basin floor. Testing on the uplift of the spilling basin floor has been completed, and the results are available upon request. The Corps is adding a plexi-glass floor to enable one to look up into the spilling basin to see debris and flow patterns. Rebecca Kalamasz asked when the new additions and tests were scheduled. Dan Katz stated that it should be complete by the end of December.

Steve Rainey stated that he understood Dan as saying the erosion repairs and deflector optimization would be complete prior to the spring of 2003 and asked the potential for getting outfall relocation finished. Dan Katz stated he thought it would complicate things too much to add additional construction, but it could be possible. With the suspension of voluntary spill, the powerhouse could be full next spring and should provide good outfall conditions at the current location. Rick Emmert stated it would have to be a separate contract because that is a different type of work. There was discussion on the outfall relocation.

Anneli Aston asked how soon the Corps would know if options in phase 2 would need to be done so her department could start on the environmental compliances for that construction. Dan Katz stated that the model study should be complete by the end of December and would show if anything in the phase 2 construction schedule, needed to be done.

Steve Rainey asked if the Corps anticipated any timeframe for an agency trip. Dan Katz stated September would be good.

2. PROGRAM UPDATES.

a. Fish Ladder Temperature Control. Rebecca Kalamasz stated that several years ago the Biological Opinion (Bi-Op) asked to have the different temperatures in the ladders investigated and the potential impact to adult fish. That was done for a few years and, then, faded out. It has come up again as an important item to be addressed.

Gene Spangrude distributed handout 3. Gene stated the basic question the Corps is going to try to answer is: Are the fish ladder water temperatures significantly different from project forebay and tailwater temperatures? Gene asked for feedback on what temperature is significant. Gene stated he has been collecting existing data since May and is developing a data visualization tool. This year's last effort is to prepare a brief report of the findings to date (see handout 3, page 3, for an outline of the proposed report). Rick Emmert stated that the biological conclusions of Bjorn should be added or at least summarized in this report. Rebecca Kalamasz suggested that under the heading of recommendations the addition of a sub-element that addresses how to handle future data should be added. Rebecca stated the question in the beginning of the study was: Does it affect their passage rate, passage time, or entry time?

Now the main question is: What is their exposure time? There was discussion on the different ways the study could be conducted. Steve Rainey suggested a possible prototype investigation.

Gene Spangrude stated that the Corps has taken data at over 50 locations within the ladder systems. These locations include ladder entrances, exits, junction pools, collection channels, *etc.* The information also includes data taken in-river for research programs conducted by Bennett and Bjorn, as well as the data collected at Total Dissolved Gas Monitoring Stations (TDGMS). Gene showed examples of how the Corps temperature probe system is set up. The website for the specifications on the probe being used is http://www.onsetcomp.com/. Rick Emmert asked if the Corps were going to separate the day and night data. Gene stated that could be done. There was discussion on the different examples of data collected and ways of filtering the data to a manageable amount. Gene asked if there were an established protocol published about averaging temperature data. Bill Hevlin stated that in the water quality team there were several different concepts being used. He did not know much about it but will check and find out the best contacts. Rebecca Kalamasz stated that the Corps presently has a contract with a company that is looking at the gas and temperature model and correlating the data to the adult fish passage. Steve Rainey thought that would be a good resource.

Rebecca Kalamasz summarized this discussion. The report can be broken into two phases: The first being the physical data, with reference to the biological data, and the second a biological report. Criteria for breaking down the analysis of the data will need to be provided. There was discussion on the breakdown of the existing data.

b. Review of Drought Initiatives. Mark Smith distributed handout 4. He stated that at the April brainstorming meeting it was decided that flow pulsing at Lower Granite Lock and Dam (Lower Granite) might be a good option. The regional decision was to not pursue that this year, largely due to the potential risk to the summer run. During the April meeting, the north powerhouse loading in the summer was one of the options discussed for McNary. Mark stated that was being accomplished now and appeared to be helping significantly. Direct barge loading to reduce handling was also discussed at the April meeting. The Corps has not done any direct barge loading yet this year because the fish facility temperatures have not been in a high enough range to cause any concern. The third option discussed was the use of flow inducers or mixers in the south end of McNary to try to mix the flow in the cul-de-sac area that gets real warm. The inducers were installed last week (see handout 4 for details on how the flow inducers were installed and how they are being operated) and will be operated and analyzed from now until approximately the end of September. There was discussion on the testing of these inducers. Mark Smith stated that the Corps is getting good first year data and should show whether or not flow inducers are going to be a good concept. Bill Hevlin asked what had been done to address

fish impact. Mark stated that box screens were installed on all the flow inducer propellers and hydro-acoustic adult (could not understand) telemetry equipment was placed on them as well. There was discussion on the conditions at the McNary cul-de-sac and the location of the temperature probes. Tim Wik asked if it were better to push the cool water into the warm water or the reverse. Mark Smith thought that was a good question. This year, the Corps is pushing the cool water into the warm water. Discussion continued on the flow inducers and their placement. Rebecca Kalamasz stated that the object of this project this year was to find something that would be an improvement for fish. The temperature modeling effort will help identify or better define the environment to help determine long-term solutions to the temperature problem.

Mark Smith stated at Lower Granite the fish hold in the forebay and asked if that was really a problem. Steve Rainey stated he thought it was a problem at some projects. In low-flow years, the forebay delay is longer, there are aggregations, and a bigger predator problem. There have been no studies on forebay delays. Mark Smith stated he felt that needed investigation. Forebay delay is not the same every year, but it happens every year. There was discussion on the forebay delay problems. Bill Hevlin indicated he thought some forebay delay was beneficial for collecting more fish for barge loading. Discussion continued on the forebay delays. Rebecca Kalamasz stated fish passage time was an area that needs to be reviewed. The main questions are: What are the problems causing delays for the fall chinook, and what are the problems with temperature for fall chinook? She feels the Corps should do a study and find the problem, isolating down to passage time through the reservoir and forebay while looking at radio telemetry data. Mark Smith stated the current plan at McNary is to use this year's data, readjust the flow inducers, and redo the study next year. Then, they will start looking for more permanent solutions by developing a numerical temperature model. There was discussion on the development of finding solutions to the temperature problems and the different existing budget line items.

c. <u>McNary Juvenile Fish Facility Improvements</u>. Chuck Palmer distributed handout 5. Chuck stated the two fish facility improvements at McNary are: the 36-inch Passive Integrated Transponder Tag (PIT Tag) detector in the bypass and the debris-plugging problem in the 10-inch chinook and steelhead river release lines. The Corps had HDR Engineering Inc. do some preliminary studies. The debris-plugging study is only 30-percent complete, but should not have many changes in the 100-percent study. The study suggests rerouting the steelhead line by the head tank, out over the river, and tie it into the outfall to get it all above grade. The chinook line needs to be regraded, lowering the slope underneath the separator, and tying it into the outfall. The Corps has received the final package from HDR Engineering Inc. on the PIT-Tag project. Work on plans and specifications have begun, and the Corps hopes to have it ready to advertise in September so the equipment can be installed in this year's work window (see handout 5 for details and schedule). Steve Rainey stated he has

had several requests for adding a water cannon at the outfall. Birds are endangering the fish. Chuck Palmer stated it could be installed most anytime. There was discussion on the rerouting of the river release lines and the pelican problems at the outfall. Rebecca Kalamasz asked if adding a water cannon would be difficult. Chuck Palmer stated the only problems he could see would be time, manpower, and schedule. It was decided that Chuck should check into adding the water cannon installation to the existing project improvements. There was discussion on next year's possible relocation of the outfall. Rebecca Kalamasz asked why the location of the McNary outfall was a concern. Steve Rainey stated it was partly because of the length of the flow path and the shallow part of the river.

d. Adult Collection Channel Fallback. Chuck Palmer distributed handout 6. Chuck stated that adult fish have been seen in the juvenile collection channel. There is concern that the adult fish are getting trapped and, in turn, delaying their migration. The Corps was asked to find ways to provide easier access out of the channel back into the river. The HDR Engineering Inc. is working on a report for options to help correct this problem. The 50-percent report has been submitted, and they hope to have the 100-percent report completed this month. The preferred plan is a (could not understand) type ladder in the collection channel with a false weir and an outfall pipe into the tailrace. The HDR Engineering Inc. is looking at two options for tailrace release locations. The final report on the locations has not yet been submitted. That report should be received the end of this month and will be sent out for review and comment at that time. There is money budgeted next year to design and construct a prototype system, as well as testing the prototype. Chuck stated it might be a little premature because no test results have been received that would indicate a problem. Rebecca Kalamasz stated she had gotten a very brief summary of last year's radio telemetry data showing very little adult fallback. The few fish that do fall back into the collection channel do not stay very long. There was discussion on the adult steelhead holding. Paul Ocker stated that many fish have been seen at the upper end of the channel trying to jump into the last orifice, and that is where they seem to stack up. Rebecca Kalamasz asked if there were fish holding for 24 or 48 hours and jumping up against an orifice is it a concern. The majority of the meeting participants indicated that it was a concern. The general consensus was to proceed with the prototype. Chuck Palmer indicated a final decision needed to be made soon if it is going to be done in this winter work window.

3. Removable Spillway Weir (RSW).

a. Construction Status. Kevin Crum distributed handout 7. Kevin reported that the perforated plate replacement contracts for McNary, Little Goose, and Lower Granite are complete. All the perforated plates were replaced at Little Goose and Lower Granite. The surface bypass collector (SBC) modifications at Lower Granite are essentially finished, with only a small amount of pickup left. The fabrication work on the RSW was completed in May, and on

June 14, 2001, the construction company started shipping via the river. It took approximately 4 days and was at Lower Granite on June 18, 2001. The window that was coordinated to start installation was June 20, 2001, with a 3-week period to install the RSW. The installation started on time on June 20, but on June 24, while trying to rotate it into position, the RSW was damaged. The seal element rotated unexpectedly, hit the dam spillway pier nose, and damaged the seal and a seal plate. The RSW has been repaired, but with the repair time and some additional modifications, the 3-week window was lost. The necessary changes to complete the RSW have been coordinated with NMFS, and a new completion date of August 15, 2001, has been scheduled (see handout 7 for schedule breakdown).

b. Hydraulic Evaluation. Lynn Reese stated hydraulic testing would be done in two or three tests. For hydraulic testing from a structural prospective, the most uncertainty lies with the closing and opening of the container gate sequence. The container gate opens at approximately 1 foot per minute. After the gate is opened, the Corps will observe the flow over the RSW in approximately 20 to 30 minute periods. The Corps will be watching for standing waves and will video it from different angles. After that period of time, the Corps will go through the process of closing the container gate and will discuss the process of shifting the RSW with Reese (could not understand last name). Lynn stated one whole test cycle should take approximately 1 hour. Bill Hevlin asked what the date was for this testing. Lynn Reese indicated that a date has not yet been set, but thought it would be sometime in September. Kevin Crum stated he had blocked out some time in September to coincide with the possible release of water from Dworshak Dam (Dworshak). Kevin indicated the date for testing was really not that critical, they could just pick a date, go to the Technical Management Team (TMT), tell them they want to do the test, and run it through the system. Bill Hevlin stated the Corps could go through NMFS and one of their TMT people could take it to TMT, if he deemed necessary. Ann Setter stated there had been quite a few fish still running in the fall the past few years, and this year there is coho running. Paul Ocker stated the Corps had meetings in Portland on September 16, 2001. Steve Rainey stated there was a Portland FFDRWG meeting on September 12, 2001. There was discussion on when the best time would be for the RSW testing. Kevin Crum asked if there were any adult issues for this possible 3-hour duration. Bill Hevlin stated he did not think there would be. The members of FFDRWG agreed on September 11, 2001, for the hydraulic testing of the RSW at Lower Granite.

c. Biological Evaluations 2001 and 2002.

(1) Balloon Tag Test. Tim Wik stated there were two options for the balloon tag test. One option would be to do the test in October or November. The other option is to wait until next March and try to do it before juvenile migration season. There has been a contract awarded to do this test. Tim stated that Kim Fodrea from Bonneville Power Administration (BPA) indicated they

would not like the test done this fall because of the water use. In 2000, the last balloon tag test that was done with the surface bypass collector (SBC), the Corps opened the tailgate, released some fish, closed the tailgate, and then recovered them. The BPA would prefer this method of testing. It would be the best method for fish recovery and help with the water use. There are issues with the opening and closing of the gate with the RSW. There was discussion on BPA issues. Tim Wik stated there were a few things the Corps needed to check regarding the viability of the fall test. Steve Rainey asked how many fish would be involved. Tim stated they had discussed testing with the RSW in two places, so it might be approximately 400 fish. Steve Rainey asked about the regular spillway. Tim stated that it would be the same as it was for the SBC. Kevin Crum stated for the balloon tag test the Corps would not need to set up all the training flow that was discussed before: two or three spill bays could be run. Steve Rainey stated the main concern with the balloon tag test would be what the immediate mortality level would be. Paul Ocker asked how far open the RSW had to be to operate at full potential. Lynn Reese indicated that it needed to be open approximately 5 feet. Mark Lindgren stated the RSW needs free flow, it cannot be operated partially open. There was discussion on how the RSW would be inspected. Cameras, as opposed to divers, would probably be used. Tim Wik asked what everyone's preference was for the balloon tag testing. It was unanimous that fall would be the best time. There was discussion on the balloon tag testing. Bill Hevlin stated the October or November timeframe should be proposed to BPA, asking them when the best time would be. Ann Setter stated that water was usually available in November.

(2) Acoustic Tag Tracking 2002. Tim Wik stated that Tom Carlson had been having some problems with air estimation on acoustic tag locations as far as the geometry of the hydrophone arrays were concerned. The Corps did some field-testing at Lower Granite in June. Tim indicated he had not received any results on those tests, but was told that Tom got the information he needed. There was discussion on the acoustic tag testing. Bill Hevlin stated that before this testing gets any support they will have to see how it has helped. A report showing better precision and better feedback would be helpful. Lynn Reese stated the presentation given by Nessler gave him a better prospective on the acoustic tag tracking. Discussion continued on the results of the FY 00 testing.

(3) Operation for 2002. Tim Wik showed a slide with questions that needed to be answered when running the RSW test.

- How does it perform with low spill. What percentage of fish go over the RSW with low spill.
- How does it perform with moderate spill. What percentage of fish go over the RSW with moderate spill.
- How does it perform with low spill compared to a moderate spill without the RSW.

- How does it perform with low spill compared to a low spill without the RSW.

Tim stated that when he talks about low spill and moderate spill, he is talking about a low spill of 10 to 15 thousand cubic feet per second (kcfs) and a moderate spill would be 30 kcfs. These would be presumably 24-hour spills. There was discussion about comparing RSW performance with some level of low- to moderate-spill against the Bi-Op spill. Steve Rainey stated, as he recalled, the sequence of events were: a FFDRWG meeting in late October and go to the Corps, Waterways Experiment Station (WES) in early December. It was in that timeframe that it was realized that the RSW would not be ready for FY 02, so that deferred some of the imperative for a study plan for FY 02. After what was observed at WES, the recommendation was that there was a minimum spill with RSW that was necessary in order to get good juvenile egress conditions. That was a little higher than the 10 to 15 kcfs spill. Steve Rainey stated he thought the key question was: How does RSW spill compare with spill to the cap? If it does not perform better than spill to the cap, then the other questions would be irrelevant. There was discussion on tailrace egress. Tim Wik indicated that he would like to see the RSW operated with a fairly small amount of spill. He feels that is an important piece of information to obtain. After NMFS looked at the model down at WES, they indicated the amount of spill needed to provide adequate egress conditions in the tailrace was more than what the Corps would have liked to see from the RSW test standpoint. Tim stated his point was: it should be tested to determine what the fish do under these lower conditions in the tailrace and not rely so much on the model to tell exactly what is needed to get adequate tailrace egress. Steve Anglea stated he thought it would be worthwhile to evaluate something at the lower spill. There was discussion on flow levels, tailrace egress, and RSW testing.

Rebecca Kalamasz stated the two things she was hearing were: Steve wants to establish the optimal performance range of the RSW to be able to make better decisions in the future for the unique situations at the different projects, but there is also a concern of fish impacts that exist in the system. Those two things are in conflict of each other because, to establish an operating range, you need to test all reasonable ranges. Paul Ocker stated from a scientific standpoint he would support just having the RSW running as a baseline. Discussion continued on the RSW testing. Ann Setter indicated that none of the organizations are going to be willing to jeopardize fish runs for the sake of research. Ann stated that, in order to prove the concept of the RSW, it could take a year of testing. The concept needs to be proven first, then tested with a wider operation. Steve Rainey stated the key issue is: how does the RSW compare with what is already available. How does it compare with the Bi-Op spill, training spill, *etc.*

Rebecca Kalamasz stated, when looking at optimum performance range, what needs to be looked at is: forebay passage time, numbers of fish passing through, through which route they are passing, tailrace egress, and then ultimately survival. Discussion continued. Bill Hevlin stated he did not feel that the number of fish going over the RSW was that important mainly because most fish at Lower Granite are transported anyway. So a low-spill test in the daytime could be good information. Mark Lindgren stated he would like to identify every single issue the Corps thinks they might want to do on the RSW, then look for efficient ways to accomplish those issues. Tim Wik proposed putting together a sub-group to meet, before the next FFDRWG meeting and discuss proposed RSW testing. Discussion continued on the RSW testing and the sub group meeting. Paul Ocker asked if there were a plan to remove debris caught in the forebay at Lower Granite. Lynn Reese stated it should flush right through the RSW. In regards to other debris, the removal would be normal operations.

4. Construction and Modifications.

a. Little Goose Pit Tag Diversion System. Jim Cain distributed handout 9. Ann Setter stated she wanted to see the access to the diversion system that was dropped from the plans put back in since this project has been pushed back another year. There was discussion on the different places there should be access in the line. Jim Cain stated the bids for this project came in too high so the project was postponed. The Lower Granite portion was broken out because it was fairly small. The Lower Granite portion of this project has been completed. There have been no negative comments. Marvin Shutters indicated that the evaluation went well. Jim Cain showed slides of the old design and the changes that were made on the new design (see handout 9). The overall plan is to take a separate line to the end. The objective is to take out the head boxes and route the fish (could not hear) and dewatering section. Jim Cain indicated the estimate for construction is approximately $300,000. Bid openings need to be advertised soon in order to make the winter work window. Jim Cain stated the big question is whether this is a high priority or not. Lynn Reese stated the bottom line question now is: will it make the cut this time? If the answer is yes, then it is full-steam ahead to try and figure out how to do it. Steve Rainey stated maybe this was something that needed to be discussed with SCT and get a response. Bill Hevlin asked what the real benefits of this project were. Some benefits named were: it takes the head boxes out, helps the PIT-Tag fish, and streamlines the route. There was discussion on the different benefits to this project. Steve Rainey pointed out that the information collected by the PIT-Tag detection is of great importance when it comes to making many decisions about the fish, like transporting or not transporting, *etc*. Bill Hevlin stated he had a sense of this project's importance and will present it at the SCT meeting.

b. Adult PIT-Tag Detection. Cary Rahn distributed handout 8. Cary stated NMFS had completed an in-water field test of the antennas on the Oregon shore. Field testing on the Washington ladder has also been completed. Both sites

provided favorable data. Pages 2 and 3 of the handout show the locations of the antennas. The Corps is proceeding with installation on section 25 of the Oregon ladder and section 14 on the Washington ladder (upper portion of the ladder prior to the hairpin turn). The Corps will be initiating a multi-phase acquisition plan in order to expedite some of the long (could not understand) plus have the site in the best condition for installation. Phase 2 of the acquisition plan is to have two separate purchase orders for the actual installation of the electronics buildings. The electronics buildings will be located on the Oregon shore at approximately section 18 or 19. The buildings will be 10 foot 8 inches by 12 feet. Construction should begin in September, be completed, and in place by the end of November. Cary discussed the budget amounts for this construction. The architect engineer (A/E) is initiating plans and specifications for the weir modification. Bill Hevlin asked how many weirs would be modified. Cary Rahn indicated there would be eight consecutive weirs modified. Steve Rainey asked Cary to show which weirs on the Washington shore would be modified. Cary showed the location using handout 8 and indicated there was a box showing the location in the left hand corner of the second page (weirs 301 through 308). The south shore weirs are shown on page 3 (weirs 278 through 286). Rebecca Kalamasz stated there was some discussion of priority of PIT-Tag installation at Ice Harbor Lock and Dam (Ice Harbor) or Lower Granite. The PIT-Tag detector installation at McNary was driven more by transfer studies.

Originally, the best design decided on was for detectors at Ice Harbor and Priest Rapids. Since the Corps does not have a lot of control over Priest Rapids, the only place for the detectors was McNary. The reason why the upper projects were designated for transfer studies (originated out of McNary) was because the survival past the project was deemed more important than just to the project in which the fish were tagged. That is why Ice Harbor and Priest Rapids were first identified as the priority project, and McNary was the fall back. The recent discussion is: "do we go to Ice Harbor or do we go to Lower Granite?" There is some concern, based on adult telemetry data, that there is some delay occurring at Lower Granite that is due to the trap. This information is derived from fish that are radio tagged. The reason for the delay at Lower Granite is radio-tagged fish entering the trap are often held overnight, handled, and then released. The people that run the trap do not believe there is any impact other than delay of radio-tagged fish. The question is: Do you put in a detector at Lower Granite and allow the PIT-Tag detector to replace the operation of the trap? Because of the volume of fish collected at the trap, it is unlikely the operation of the trap would be shutdown with the installation of the PIT-Tag detector at Lower Granite.

The BPA asked the Corps to develop a study design that more strongly defines the needs of an adult PIT-Tag detector at Priest Rapids, and, then they could apply pressure and get a detector installed at Priest Rapids. If that happens, then both upstream routes for adults would be covered. The FFDRWG representative is supposed to have a site recommendation at the upcoming SCT

meeting. Anne Setter asked the percentage of adult coverage at Lower Granite. She felt that agency people are looking for total coverage like what will be at Bonneville Lock and Dam (Bonneville) next year and possibly at McNary. There was discussion on the coverage at the different projects. Bill Hevlin stated that Lower Granite was obviously the next priority, then Ice Harbor. The question he has been asked is: Can Lower Granite take a 1-year delay? Rebecca Kalamasz stated that, to get the most information from the transfer study, the detectors need to be installed at Ice Harbor. Bill Hevlin agreed that Ice Harbor was a priority also. Rebecca Kalamasz stated if only one project can be chosen, given the fact that the trap is already existing and operational, she would prioritize Ice Harbor over Lower Granite. Steve Rainey asked if there were a benefit to Ice Harbor installation before Priest Rapids installation. Bill Hevlin stated that there was a benefit because fish indicated at McNary (or fish that made it to McNary) made it to Ice Harbor. So, it can be assumed the other fish are going up to the Yakima. Cary Rahn stated the Corps is already looking at proposed installation sites.

Rebecca Kalamasz summarized the discussion indicating it was the consensus of the FFDRWG group that Lower Granite and Ice Harbor are the highest priority. Bill Hevlin stated FY 03 would not be a big cost. The money would be used to do the sound monitoring at Ice Harbor and Lower Granite. Rebecca Kalamasz stated designs and specifications for McNary would be paid in FY 01. Actual installation would be paid in FY 02, with the remainder of the money being used for designs and specifications at Lower Granite and/or Ice Harbor. The actual construction would be paid in FY 03. Bill Hevlin indicated he thought NMFS had decided the year off would be fine because of the need to do research at Lower Granite.

5. Program Updates.

a. Auxiliary Water Supply.

(1) Ice Harbor. Handout 8 contains information for this auxiliary water supply. Cary Rahn stated the biggest issue is getting the pumps submittal approved. The Corps has a commitment from the pump supplier to have one pump on site this December. The Corps does not yet have approval on (could not understand). The contract was awarded as a 4-year contract, installing one pump a year, and finishing the fourth year with the south shore electrical work. The contractor has proposed installing one pump this year in January or February, along with Derrick and Bridge cranes. They would install the second pump in January of 2003. They are also proposing taking the third pump (the backup pump) off-line and installing the new third pump in March or April of that same year. That would shorten the contract by 1 year, cutting costs by one third. In the third year, the electrical work on the south shore would be done. The main issue here involves the lack of an approved construction schedule. Bill Hevlin asked if both ladders would be operational with the two new large pumps while

the third pump is being replaced. Cary Rahn explained that the third pump was just for the north shore, and the two new pumps would be sufficient to maintain criteria. Bill Hevlin asked if this schedule would avoid having to run with no ladders during the 2 weeks in January. Cary Rahn indicated that was correct. Steve Rainey asked if the installation of the third pump in March or April 2003 would include some subsequent testing. Cary Rahn indicated it would be fully tested and ready to go.

(2) Lower Monumental. Handout 8 contains information for this auxiliary water supply. Cary Rahn stated Lower Monumental has been the most critical project for getting emergency water provided to the adult fish passage system. Updates from the last FFDRWG meeting included:

- The 100-percent report on the feasibility of utilizing Juvenile Bypass System (JBS) surplus water to power a new auxiliary water supply (AWS) turbine is complete.

- Turbine pump test report, initiated to verify current pumping capacity, is currently at 90-percent.

- Pump testing confirmed the AWS system is operating at a 6-foot discharge head instead of the 4-foot head for which the pumps were designed for.

- The numeric hydraulic computer model of the adult fishway system is complete, and Northwest Hydraulic Consultants (NHC) provided the training.

- The A/E reduced the number of alternatives to be investigated as viable approaches to provide emergency water from 26 to 6. The technical report on the six alternatives is to be completed in the second quarter of FY 02.

Cary Rahn stated the Corps plans to be able to complete plans and specifications by November 2001. Lead times for use of necessary equipment, with the Ice Harbor project and work being done at Lower Granite, are extremely long (28 to 32 weeks). Even in the best-case scenario, opening for bids on May 22, 2002, in an attempt to meet a January construction schedule at Lower Monumental, would be hard to accomplish. Construction might have to be pushed back 1 year. There was discussion on the results of the testing of the pumps.

(3) Little Goose. Handout 8 contains information for this AWS. Cary Rahn indicated plans and specifications are 60-percent complete. Draft reports on the hydraulic evaluation and the pump test for the adult fishway system have

been completed. The fishway system drawing is 90-percent finished. This project was suspended for 2 months pending reprogramming of funds. This project will have open bids in March 2002, start construction June 2002, and be completed March 2003.

(4) Lower Granite. Handout 8 contains information for this AWS. Cary Rahn stated the Corps has plans and specifications to the biddability, constructibility, operability, and evaluation (BCOE) stage. Because of the lead times required for the equipment needed, construction is being delayed for 1 year. This will allow the Corps to get the gear reducer delivered, and construction can be completed in one construction period. The 1-year delay will also allow for better coordination of the EAWS work and the electrical system upgrades performed by Corps Hydroelectric Design Center (HDC). Steve Rainey asked, since Lower Granite is a smaller construction package, should the priority be changed; possibly before Lower Monumental. Cary Rahn stated the current plan is to advertise for this project in the first quarter of this next FY. The Corps would use the 2002 funds to procure the reducer and electrical gear, and, then, 2003 funds would cover the construction costs. Bill Hevlin asked how much money was needed in FY 02. Cary Rahn indicated the Corps would need approximately $450,000. There was discussion on how the budget ranking system works. Cary stated the Corps had the contractor analysis for the AWS system (see handout 8 for results). He indicated hard copies or electronic copies of the analysis are available.

b. McNary Upgrade Briefing. Dave Coleman distributed handout 10. Dave stated that they are going to open a turbine contract the first quarter of next year. The funding will be done through BPA. The contract is set up so there are lots of exits in case things do not go right. On the old turbine acquisition contract, turbines were selected on performance only. With the new turbine contract method, the selection will take into account, fish monitoring, fish physics, and many other aspects. The McNary Uprate/Reliability Study Team (MUST) contract will hire three contractors to each build a turbine model. Each model will be contractor tested, independent lab tested, and WES tested. The model will be selected on bottom-line cost, performance, and fish considerations. The other unique concept of this contract (not shown on the handout) is the Corps will be given the right to change the draft tube. Dave Coleman explained how the contract worked (see handout 10 for diagram). There was discussion on the different types of turbines.

c. McNary Turbine Survival Program Summary. Martin Ahmann distributed handout 11. Martin stated the turbines run at approximately 18,200 cubic feet per second (cfs) where the current turbines run at approximately 12,400 cfs. The question now is: Can the turbine actually perform as it is expected and can all the biological issues be met? The Corps is currently working on the fish safe criteria. Once that is established, the criteria will need to be added to the contract for the prototype turbines. Steve Rainey stated maybe

it should be turbine fish safe criteria as opposed to screen and dig well environment. Martin indicated the research is on the whole system. All the necessary components for the turbines will have to be put together and defined in the turbine contracts. The turbine fish passage criteria performance will be evaluated at WES, not specifically at an independent lab. The Corps will run a fish screen evaluation parallel to the turbine fish passage performance. A screen evaluation study team is one of the first items needing to be established. This team needs to consist of the Corps and other agencies. The prototype turbine test is scheduled for FY 06 (see handout 11 for schedule of events). Steve Rainey asked if there would be agency representatives on the evaluation team. Martin Ahmann indicated he would like to have agency representatives on the initial fish safe design criteria and on the screen design evaluation. Steve Rainey stated he would like to be included in the evaluation team.

There was discussion on the different research that should be evaluated. Martin Ahmann stated the Corps' goal is to find a screen system that functions as well or better as the existing screen system at the higher Q and find a turbine that provides as good or better survival to the fish. Bill Hevlin asked if the best screen environment was going to be designed at the same time as the turbine design. Martin Ahmann indicated they would be designed simultaneously. There was discussion on the designing of the screens.

Sean Milligan stated the Corps, working with the turbine model programs, has been working with the turbine manufacturers to develop the best test methods for testing with the fish screens in place. Martin Ahmann stated WES would build screens and supply each of the contractors with a set of screens to use for testing. Lynn Reese asked how the draft tube problems would be resolved. Martin stated the Corps has defined the boundaries in which the contractors can modify the draft tube. He stated there would be a TSP meeting next week to start the development of safe fish criteria. Martin hoped to have a meeting on the screen evaluation at approximately the end of August.

d. Lower Monumental Future Action. Kevin Crum stated the Corps would be writing a report on the study plan of (could not hear) prototype at Lower Monumental. He stated the first level of performance is to use all the assumptions that are built in at this particular time. The assumptions will be based on the RSW performance, but actual performance data next year will be added. This will be compared to similar performances of the Extended Submerged Bypass Screen (ESBS). There was some discussion on the information needed in the analysis of the RSW versus the e-screens (is this the ESBS) and when the actual testing of the RSW should happen. Rebecca Kalamasz stated she thought the ultimate document date had been pushed back. Kevin Crum stated there needed to be discussion on how the analysis should be approached, and what should be included.

Steve Rainey stated the one thing that cannot be assessed in more detail, at Lower Monumental, is spill. There was discussion on the past spill patterns at Lower Monumental. Steve stated with regards to e-screens, the decision has to be made on what variables have to be reconciled before the decision is made to go forward sooner versus later on the e-screen evaluation. Kevin Crum stated the Corps would need some input on the criteria needed for the analysis. There was discussion on what needs to be included in the analysis. Kevin indicated that when it comes to survival, does the analysis need to be done on passage through the tailrace or to below Bonneville. It was the general consensus that the analysis on survival should be done to the adult returns.

There was discussion on the transporting of fish. Rebecca Kalamasz stated that, regardless of if the decision point is picked up because there are lots of things unresolved at Lower Monumental, the Corps' plan is to work along a parallel path and (could not hear) the e-screens and the RSW. As that information is gathered, perhaps it will change or components can be added in order to come to a decision. Steve Rainey stated that survival being lower (at Lower Monumental) is currently because of the STS's rather than the e-screens. There was discussion on what would be best for survival. Steve Rainey indicated he would encourage the Corps to move forward with e-screen development and have some kind of exit question of yes or no before the dollars are spent for the hardware. Sean Milligan indicated the amendment to the Bi-Op states to compare relative survival benefits of installing e-screens versus RSW. To make that kind of comparison, you need a certain quality of data. There was discussion on what was done at John Day. Steve Rainey stated the two key elements seem to be what intercept percentage of flow can be obtained with the e-screen, then, what percentage of gatewell flow can be sent up. Kevin Crum stated, maybe, there should be a team to help the Corps develop the criteria, meet more often than FFDRWG, and help make the decision on where to go from that point.

e. Debris Program.

(1) McNary Gatewell Debris and Vertical Barrier Screens (VBS). Sean Milligan stated the Corps has been modeling debris behavior in the 1 to 12-scale McNary gatewell model at WES. Rather than modeling just hydraulics, the Corps is taking actual velocity measurements, looking at flow patterns, and modeling debris behavior. The Corps has done some baseline testing to identify how the debris behaves under existing operating conditions, then, it looked at alternatives to help alleviate debris problems at McNary. The primary problem is debris plugging on the VBS. The Corps has completed that series of tests. Nothing, so far, looks promising. Some of the alternatives have made minor improvements. Currently, the Corps is pursuing some baseline testing in the Lower Granite model. The Corps is doing those baseline tests at Lower Granite because the VBS there never plugs with debris, where as, at McNary the VBS is always plugged. A good partial explanation for that is that the type of debris is

different. The Corps is hoping to find some differences that might help the debris problem at McNary.

(2) Cylindrical Dewatering Pilot Study. Sean Milligan stated early in the debris study the primary dewatering had some problems with debris plugging the primary dewatering screens. The cylindrical dewatering concept is one that the Corps developed as an alternate to the traditional floor and side dewatering screens. There was a pilot facility built at McNary. There were many problems and delays with construction. So, late this spring, the Corps started hydraulic evaluations. The initial goal was to conduct enough velocity metering tests to set and define conditions that the fish were being put into. Sean stated that even though this project has been extremely frustrating (with all the problems that came up), the overall performance of the system is actually doing very well.

There was discussion on the McNary gatewell debris test facility and the cylindrical dewatering. Sean Milligan stated there are some other hydraulic tests that can be done with this structure that will help reduce the amount of assumptions that have to be made when the production system or production facility is designed. Steve Rainey asked where the improvements were made in cylindrical dewatering. Sean stated one of the major benefits to cylindrical dewatering, as opposed to traditional floor dewatering, is debris does not stick to the screen. Lynn Reese asked how cylindrical dewatering relates in perspective to what we have presently. Sean stated that inspection, cleaning, and repair is much easier. Steve Rainey asked what would be the next step. Sean Milligan stated the Corps would probably be doing more hydraulic testing late this fall and, hopefully, be ready for biological testing with salmon next spring.

The meeting was adjourned at 4:25 p.m.

HANDOUTS

Agenda

Walla Walla District - FFDRWG Meeting
Draft Agenda
July 24th, 2001
Harvest Room

Day 1 - Tuesday, July 24

12:30 – 1:30	**Spill Related Modifications** McNary Deflectors – Emmert Little Goose Deflectors - Emmert Lower Monumental Deflectors/Erosion/Outfall – Katz/Lindgren
1:30 – 1:45	**Break**
1:45 – 4:00	**Program Updates** Fish Ladder Temperature Control – Spangrude/Emmert Review of Drought Initiatives – Smith McNary Juvenile Fish Facility Improvements – Palmer - Facility Modifications - Non Intrusive PIT Tag Detection Adult Collection Channel Failback - Palmer

Agenda (Continued)

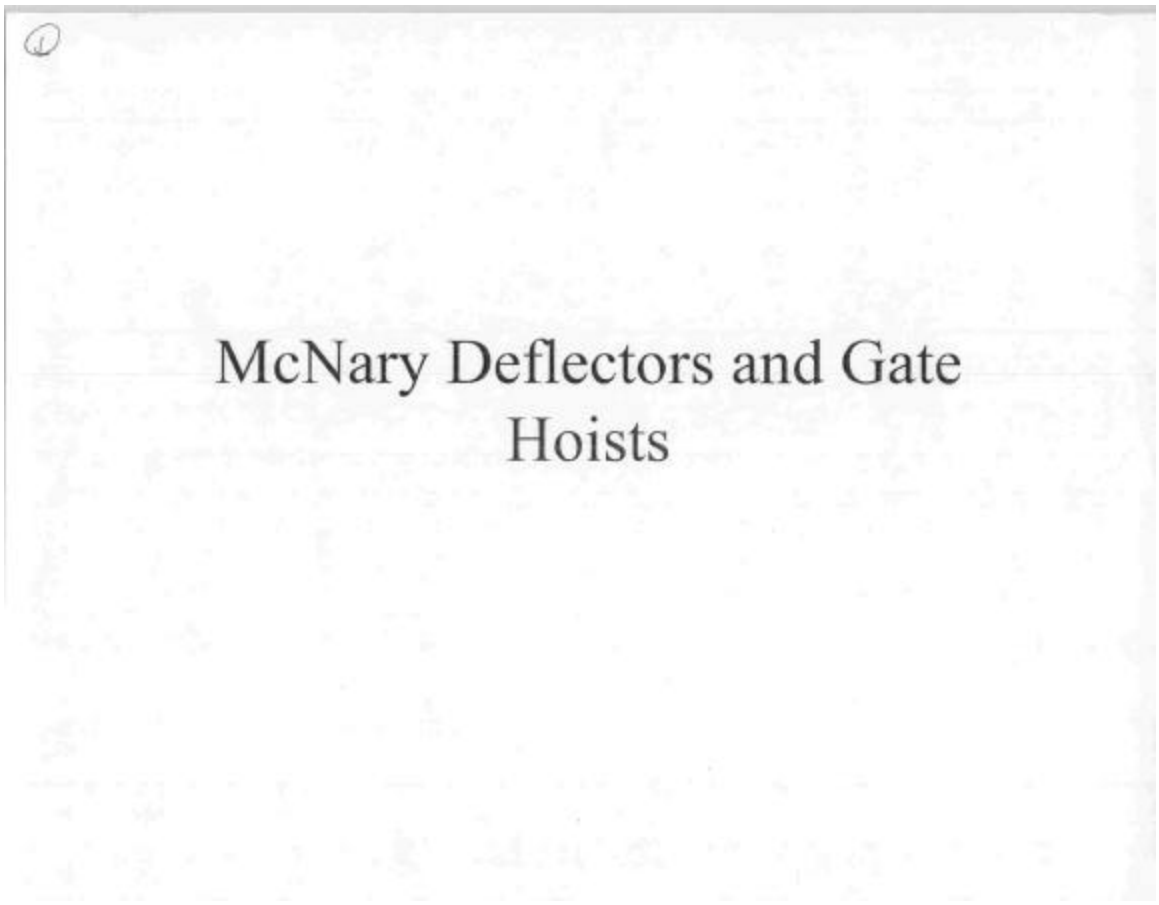
Walla Walla District - FFDRWG Meeting
Draft Agenda
July 25th, 2001
Harvest Room

Day 2 - Wednesday, July 25

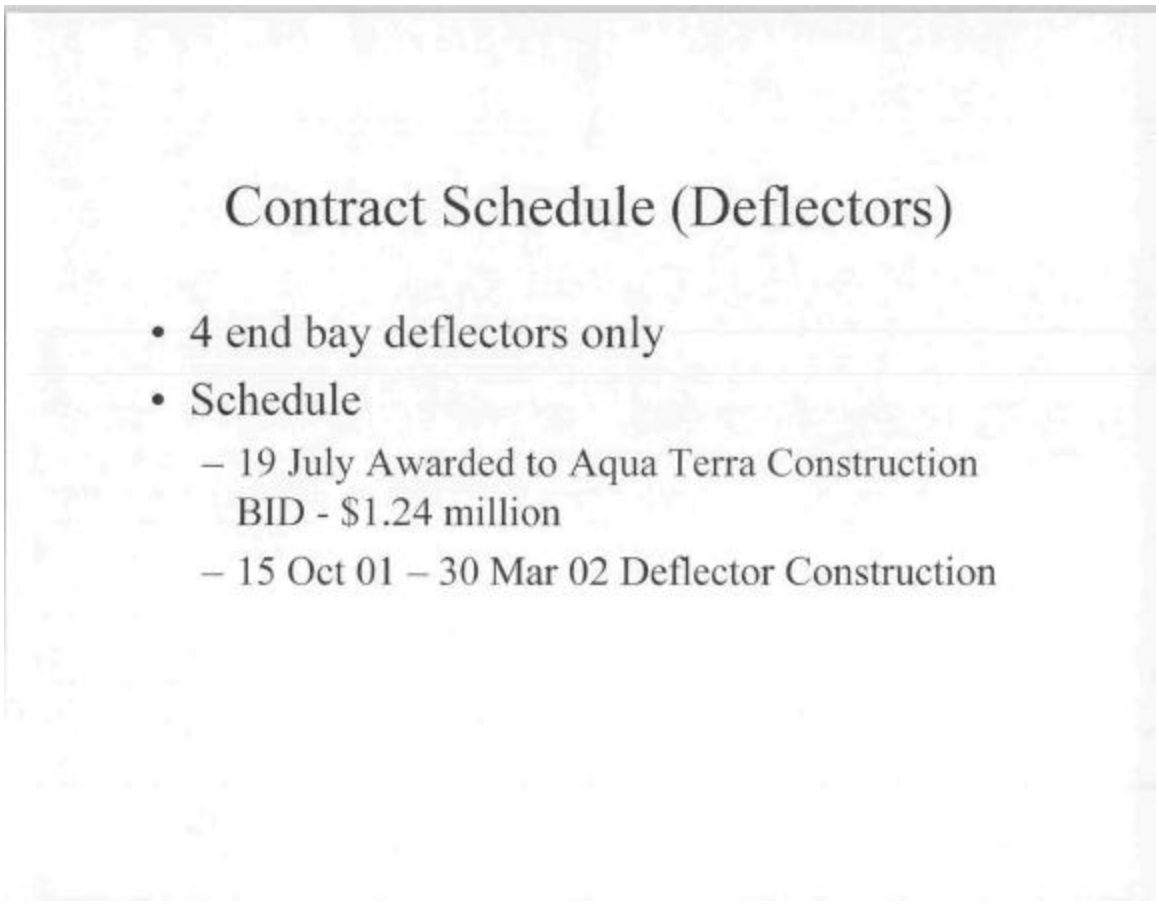
8:00 – 10:30	**RSW** Construction Status – Crum Hydraulic Evaluation - Crum Biological Evaluations 2001 & 2002 - Wik - Balloon Tag - Acoustic Tag Tracking 2002 - Operation for 2002
10:30 – 10:45	**Break**
10:45 – 11:30	**Construction and Modifications** LGO – PIT tag Diversion System – Cain Adult PIT Tag Detection - Rahn
11:30 – 12:30	**Lunch**
12:30 – 1:45	**Program Updates** Auxiliary Water Supply – Rahn - Ice Harbor and Lower Monumental - Little Goose and Lower Granite Lower Monumental ESBS/RSW/SBC – Milligan
1:45 – 2:00	**Break**
2:00 – 3:30	**Program Updates (continued)** Debris Program - Milligan - McNary Gatewell Debris Model - VBS Turbine Survival Program Summary – Ahmann McNary Upgrade Briefing - Ahmann

Adjourn

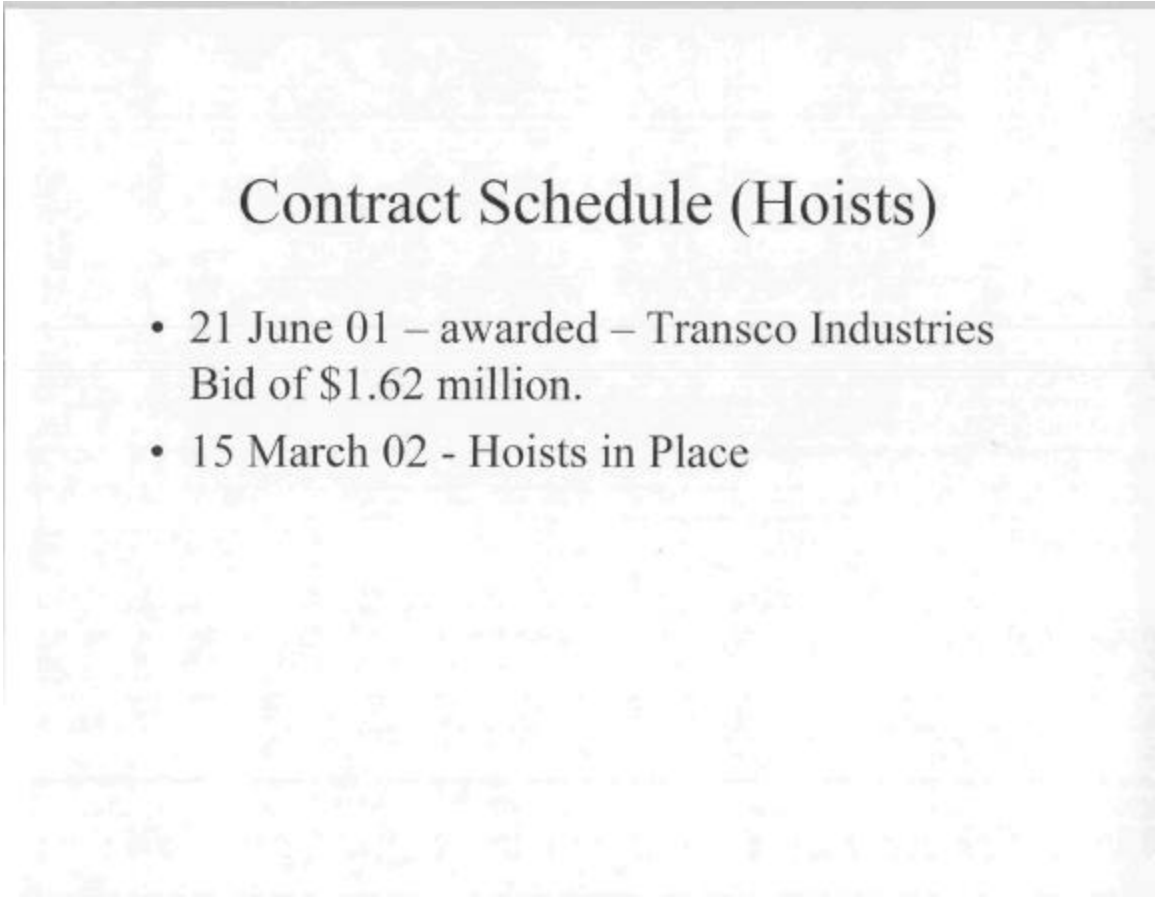
Handout 1
McNary Deflectors and Gate Hoists
Little Goose Deflectors



Handout 1
McNary Deflectors and Gate Hoists
Little Goose Deflectors (Continued)



Handout 1
McNary Deflectors and Gate Hoists
Little Goose Deflectors (Continued)

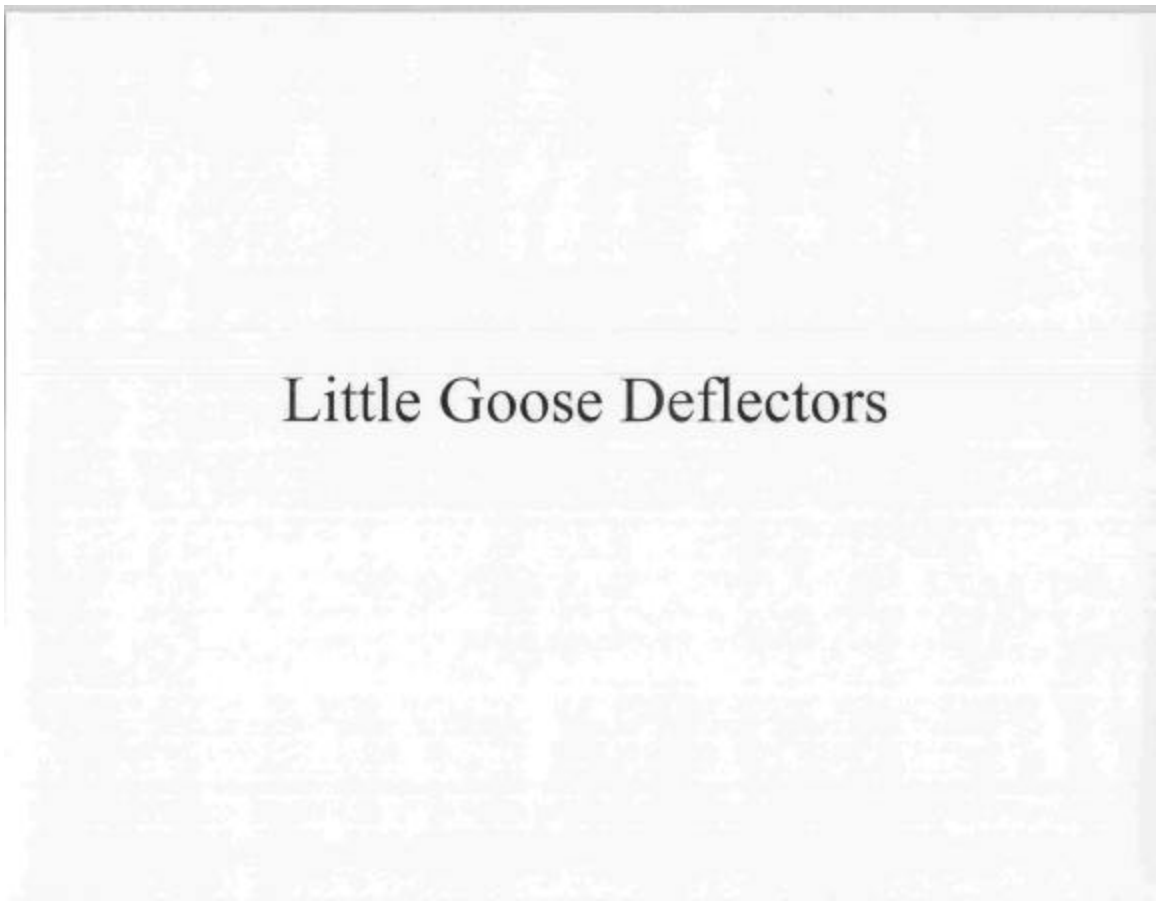


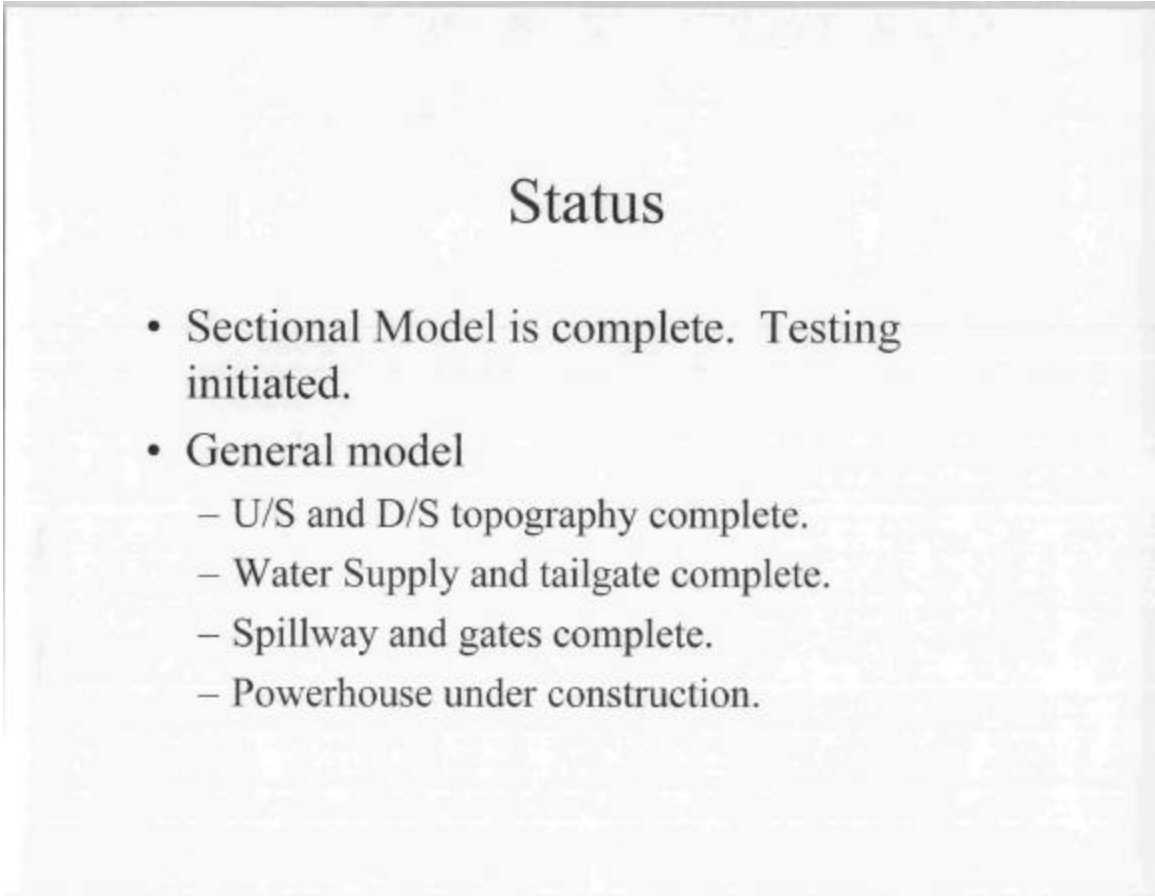
Handout 1
McNary Deflectors and Gate Hoists
Little Goose Deflectors (Continued)

Estimated Project Costs

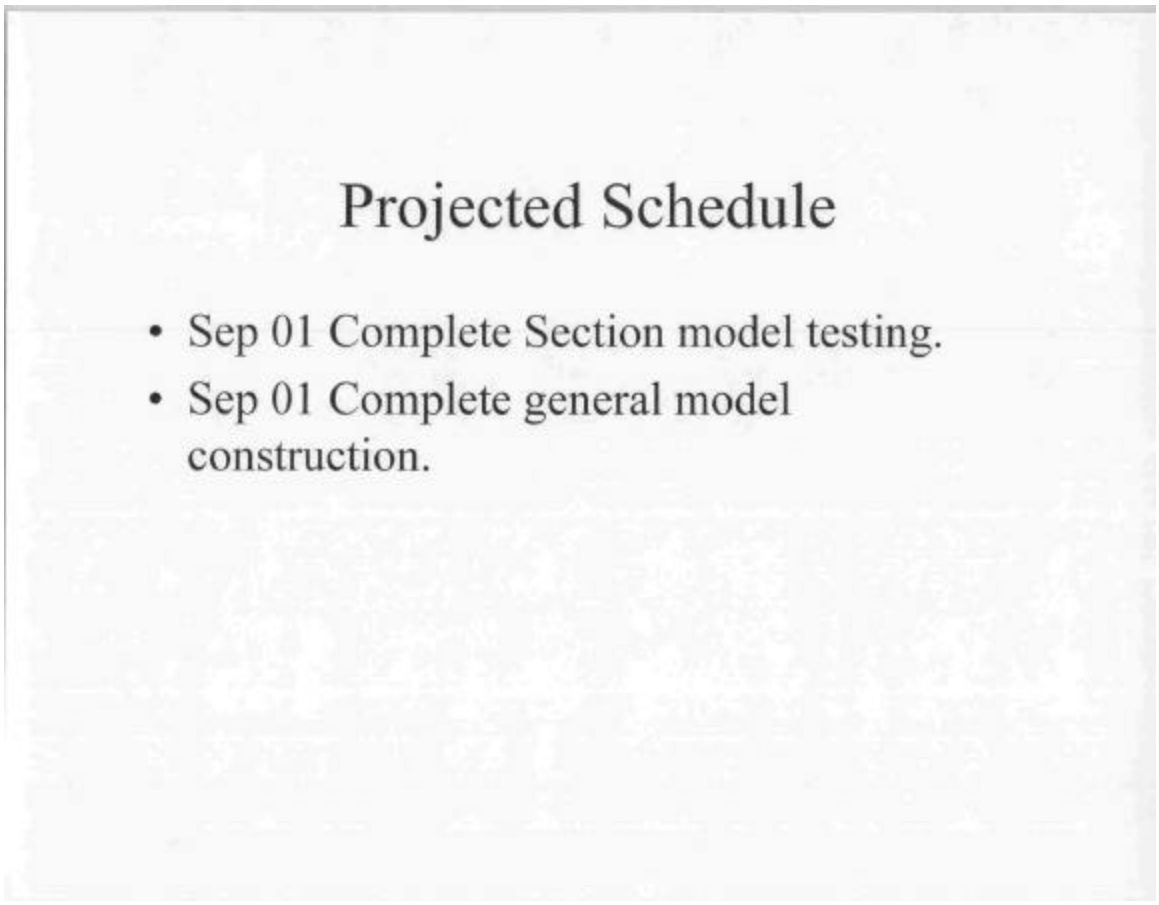
Task	FY02	FY03	FY04
Design	$ 369.00	$ 106.00	
Construction			
deflectors	$ 970.00	$ 250.00	
hoists	$ 870.00	$ 75.00	
wall extension	$ 750.00	$ 2,350.00	$ 250.00
S&A	$ 220.00	$ 275.00	$ 75.00
Project Support	$ 50.00	$ 50.00	
Post Construction			
near field test	$ 225.00		
Biological test		$ -	
Totals	$ 3,454.00	$ 3,000.00	$ 325.00

Handout 1
McNary Deflectors and Gate Hoists
Little Goose Deflectors (Continued)




Status
• Sectional Model is complete. Testing initiated.
• General model
– U/S and D/S topography complete.
– Water Supply and tailgate complete.
– Spillway and gates complete.
– Powerhouse under construction.

Handout 1
McNary Deflectors and Gate Hoists
Little Goose Deflectors (Continued)



Handout 2
Lower Monumental
Deflectors, Erosion, Outfall

Lower Monumental Stilling Basin Erosion

- Background
- Update
- Future Schedule

US Army Corps of Engineers
Walla Walla District

FFDRWG Meeting
Walla Walla
17 May 2001

Lower Monumental Lock and Dam

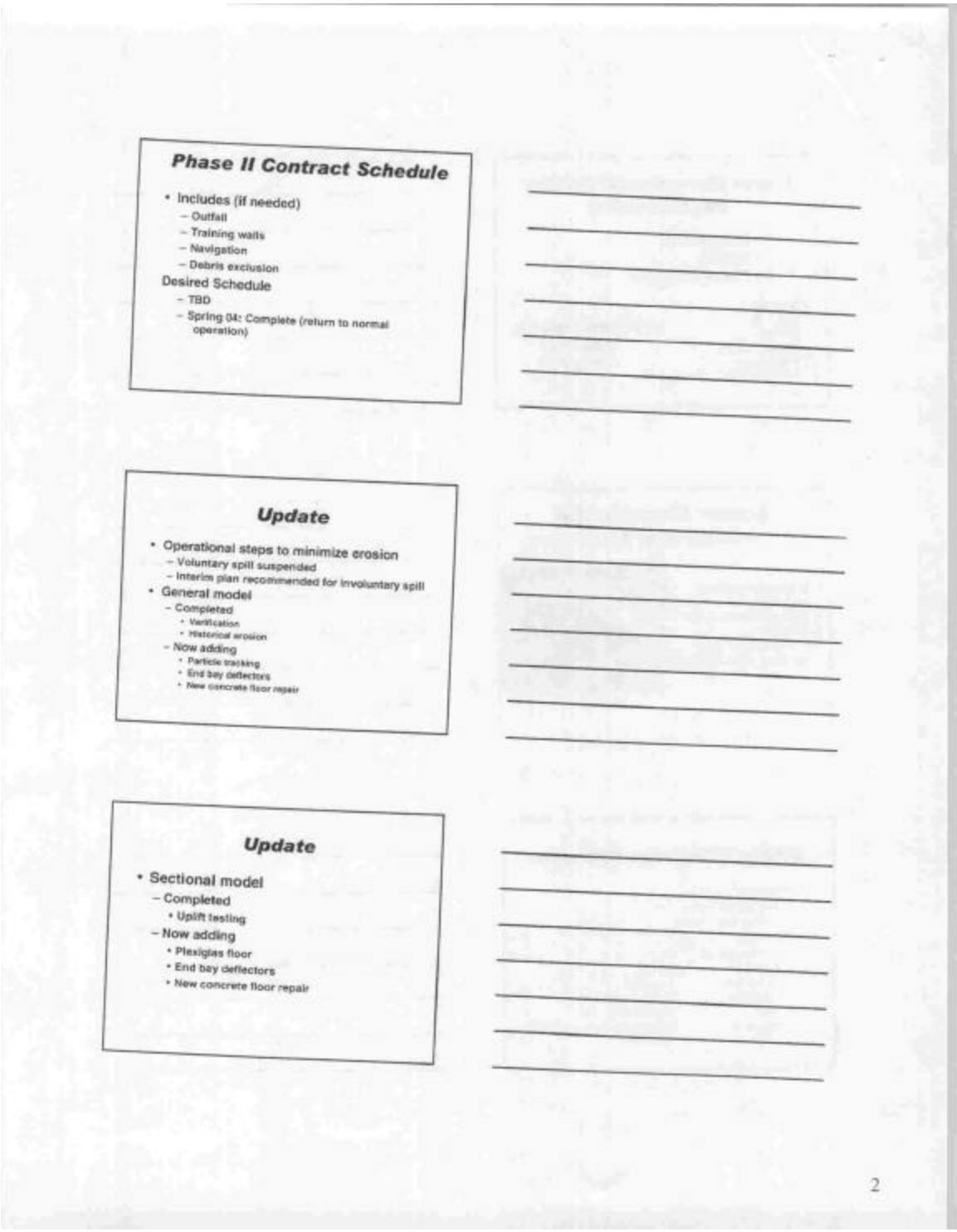
- Spillway in operation since 1969
- Spillway deflectors built in 1970's
- Stilling basin erosion increased over 20 years

Phase I Contract Schedule

- Includes
  - End bay deflectors
  - Stilling basin repair
- Schedule

– 1 Oct to Mar 02	P&S
– 1 April 02	BCOE
– 15 April 02	Advertise
– 1 June 02	Notice to proceed
– TBD	Start in-water work
– Spring 03	Complete (return to normal operation)

Handout 2
Lower Monumental
Deflectors, Erosion, Outfall (Continued)



Phase II Contract Schedule

- Includes (if needed)
  - Outfall
  - Training walls
  - Navigation
  - Debris exclusion
- Desired Schedule
  - TBD
  - Spring 04: Complete (return to normal operation)

Update

- Operational steps to minimize erosion
  - Voluntary spill suspended
  - Interim plan recommended for involuntary spill
- General model
  - Completed
    - Verification
    - Historical erosion
  - Now adding
    - Particle tracking
    - End bay deflectors
    - New concrete floor repair

Update

- Sectional model
  - Completed
    - Uplift testing
  - Now adding
    - Plexiglas floor
    - End bay deflectors
    - New concrete floor repair

2

Handout 2
Lower Monumental
Deflectors, Erosion, Outfall (Continued)

Model Schedule

- By 30 September 01 (start of Phase I P&S)
  - General model
    - Finalize deflector elevation
    - Finalize repair configuration
  - Sectional Model
    - Check flow patterns and debris movement with new deflectors and repairs in place.

Model Schedule

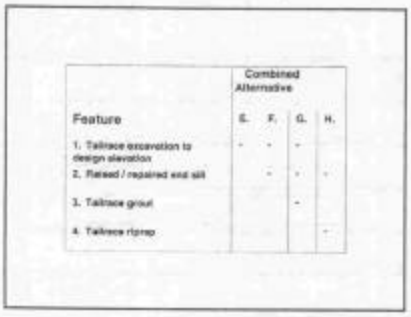
- By 31 December 01
  - General model
    - Phase II Alternatives with and without features to limit debris
  - Sectional Model
    - Check deflector performance, stilling basin flow patterns and debris movement with selected features from general model.

Alternative Solutions
Without Measures to Limit Rock Supply

	Combined Alternative			
New features	A.	B.	C	D.
1. Repaired stilling basin floor and endbay deflectors	-	-	-	-
2. Training walls between end and interior bays		-	-	-
3. Powerhouse divider wall			-	-
4. South training wall extension				-

3

Handout 2
Lower Monumental
Deflectors, Erosion, Outfall (Continued)



Feature	Combined Alternative E.	F.	G.	H.
1. Tailrace excavation to design elevation	-	-	-	
2. Raised / repaired end sill		-	-	-
3. Tailrace grout			-	
4. Tailrace riprap				-

4

Handout 3
Fish Ladder Temperature Control
Lower Snake and McNary Projects

3

LOWER SNAKE AND MCNARY PROJECTS FISH LADDER TEMPERATURE STUDY

Snake and Columbia Rivers, Washington and Oregon

Gene Spangrude

Lower Snake River and McNary Projects Fish Ladder Temperature Study

Lower Snake River and McNary Projects Fish Ladder Temperature Study

Handout 3
Fish Ladder Temperature Control
Lower Snake and McNary Projects (Continued)

Lower Snake River and McNary Projects Fish Ladder Temperature Study

A Basic Question:

Are fish ladder water temperatures significantly different from Project Forebay and Tailwater water temperatures?

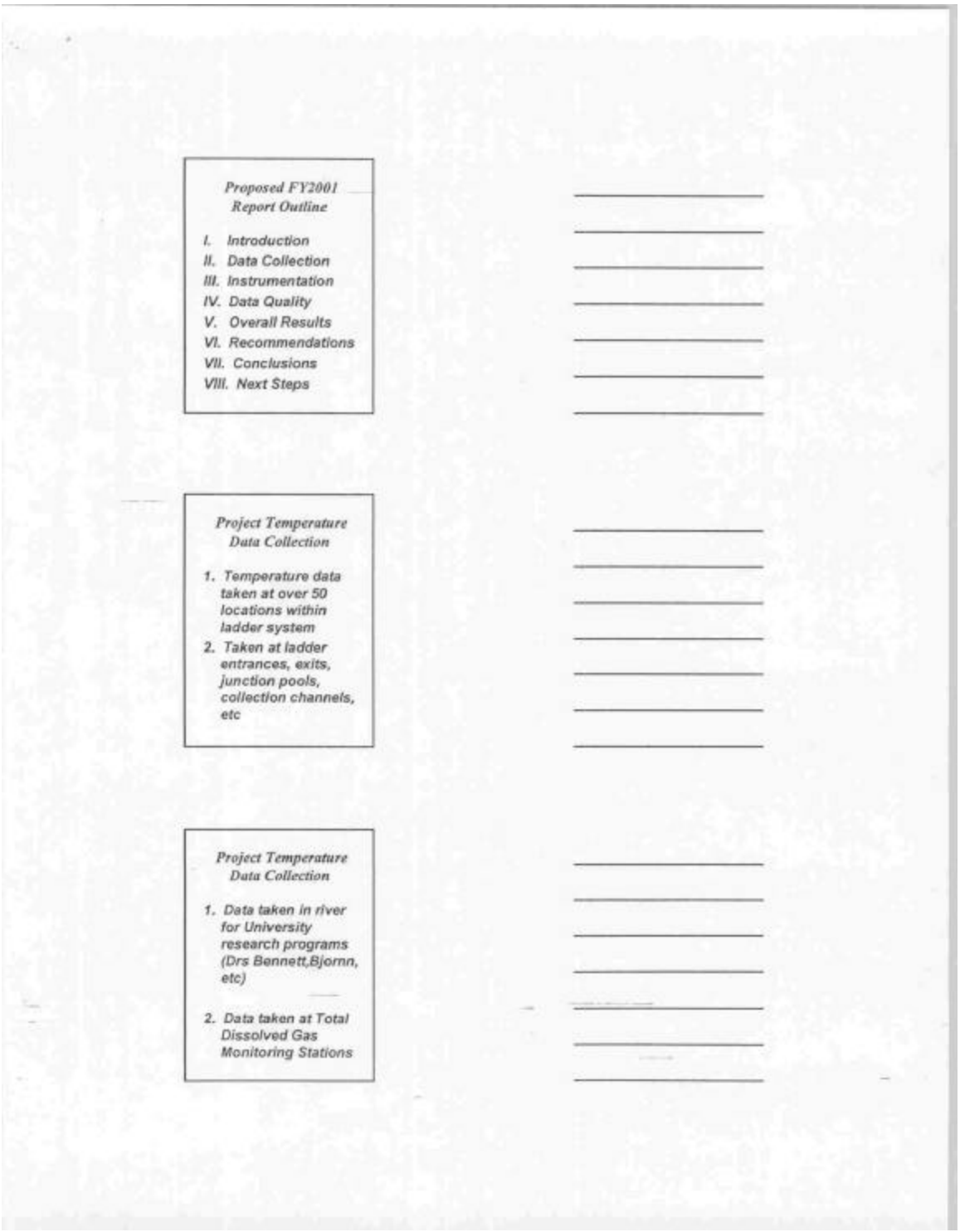
If answer to previous question is "YES"….

1. *What can be done to help this?*
2. *Where can cooler water be obtained from?*

FY 2001 Tasks Summary

1. *Gather existing data together*
2. *Develop data visualization tools*
3. *Prepare a brief report*

Handout 3
Fish Ladder Temperature Control
Lower Snake and McNary Projects (Continued)



Proposed FY2001 Report Outline

I. Introduction
II. Data Collection
III. Instrumentation
IV. Data Quality
V. Overall Results
VI. Recommendations
VII. Conclusions
VIII. Next Steps

Project Temperature Data Collection

1. Temperature data taken at over 50 locations within ladder system
2. Taken at ladder entrances, exits, junction pools, collection channels, etc

Project Temperature Data Collection

1. Data taken in river for University research programs (Drs Bennett,Bjornn, etc)
2. Data taken at Total Dissolved Gas Monitoring Stations

Handout 3
Fish Ladder Temperature Control
Lower Snake and McNary Projects (Continued)

Project Fish Ladder Temperature Data Collection

Project Fish Ladder Temperature Data Collection Probe

Project Fish Ladder Temperature Data Collection Probe

Handout 3
Fish Ladder Temperature Control
Lower Snake and McNary Projects (Continued)

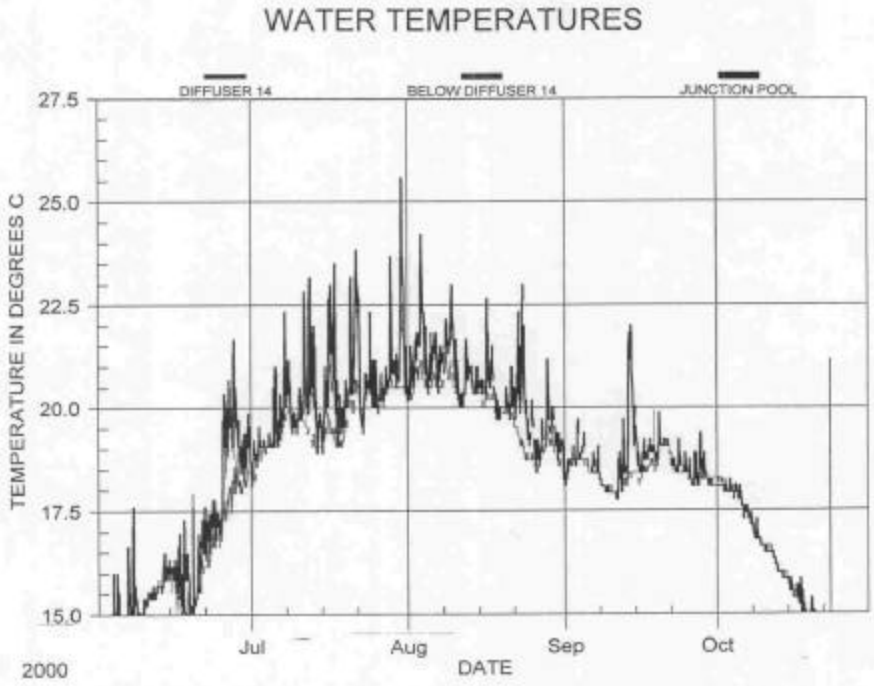
Project TDGMS Temperature Data Collection Station

Project Locations

Handout 3
Fish Ladder Temperature Control
Lower Snake and McNary Projects (Continued)

Lower Granite Project Ladder Temperatures

PROVISIONAL DATA - NOT REVIEWED OR EDITED



Handout 3
Fish Ladder Temperature Control
Lower Snake and McNary Projects (Continued)

Project Exit Pool Temperatures

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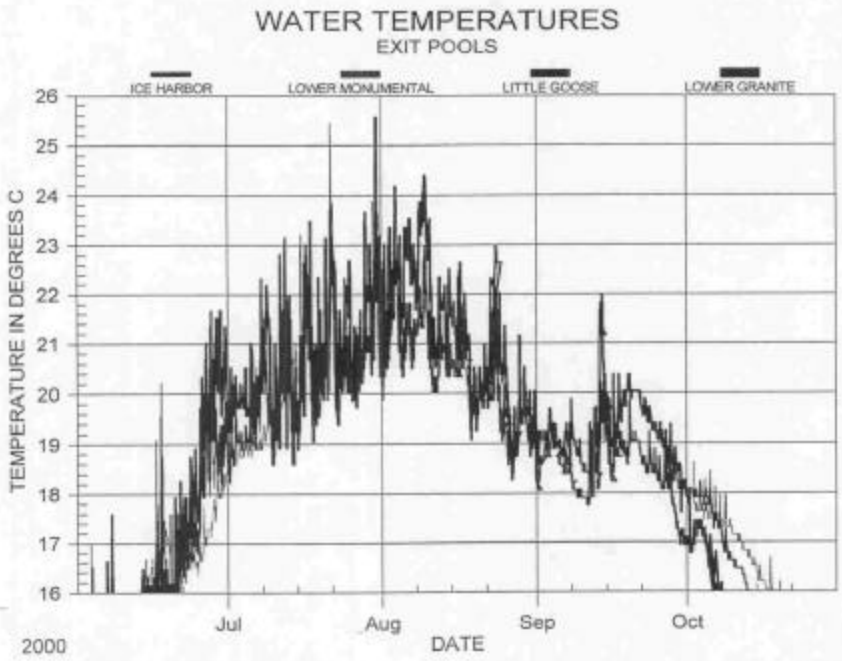


Handout 3
Fish Ladder Temperature Control
Lower Snake and McNary Projects (Continued)

Temperature Data Analysis Techniques

1. *Previous data plots illustrate complexity of understanding the "messages" given by a lot of data*

2. *Would like to simplify plots yet retain "meaning of data"*

Temperature Data Analysis Techniques

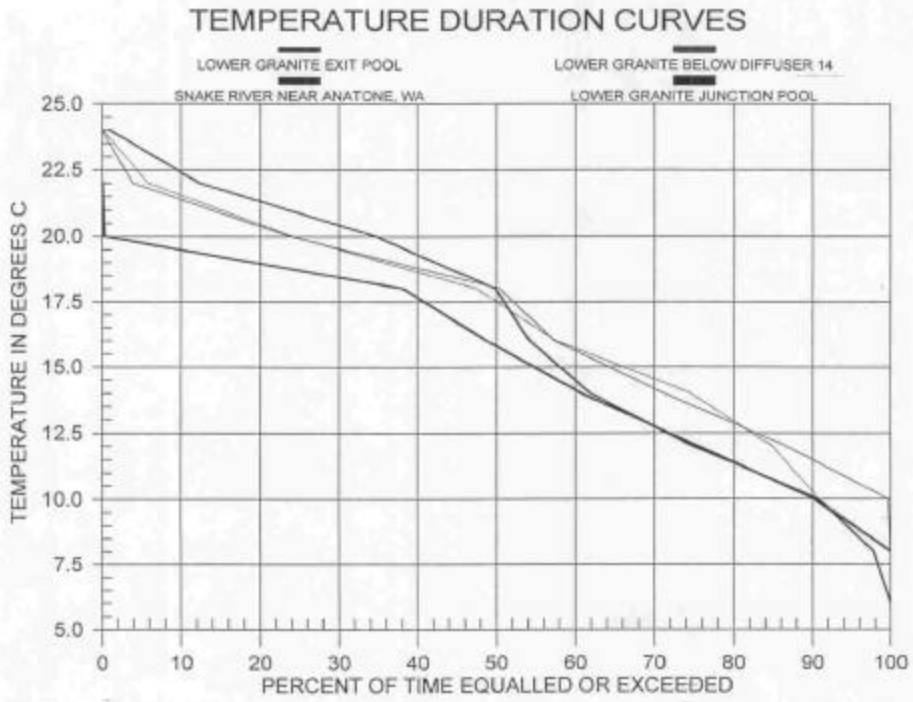
One potential analysis technique is a "temperature duration" curve- (similar to a "flow duration" curve)

Shows % of time a given value (ie 20 deg C) is exceeded

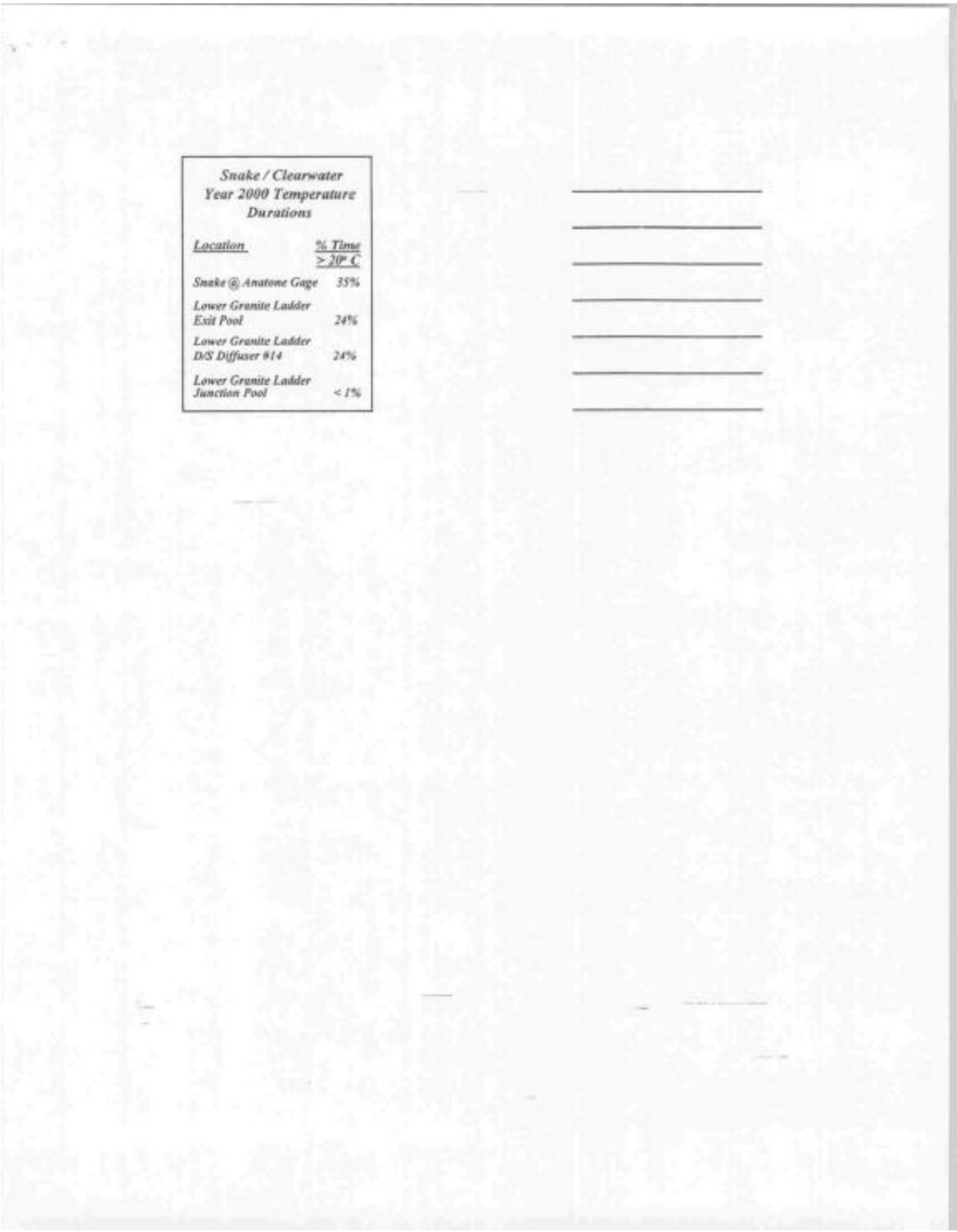
Handout 3
Fish Ladder Temperature Control
Lower Snake and McNary Projects (Continued)

Temperature Duration Analysis (2000 Data)

PROVISIONAL DATA - NOT REVIEWED OR EDITED



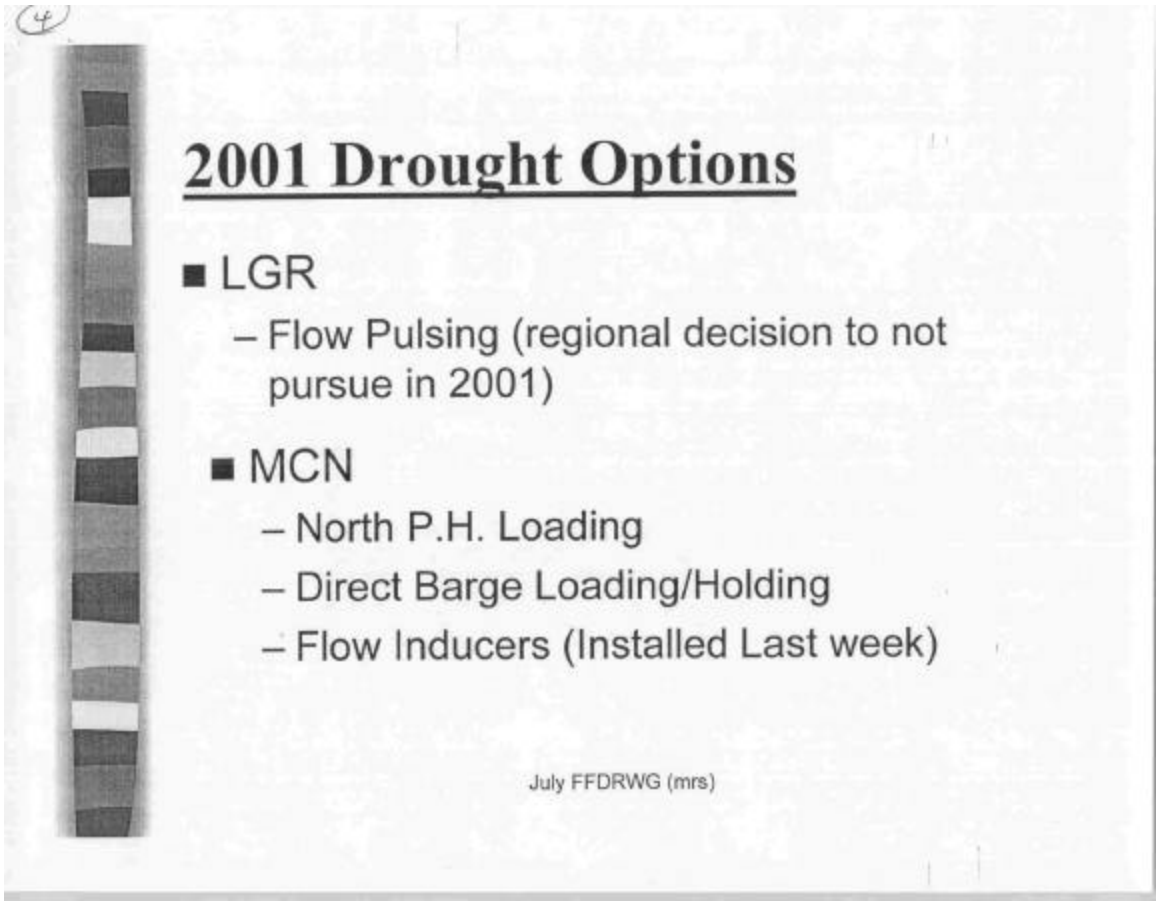
Handout 3
Fish Ladder Temperature Control
Lower Snake and McNary Projects (Continued)



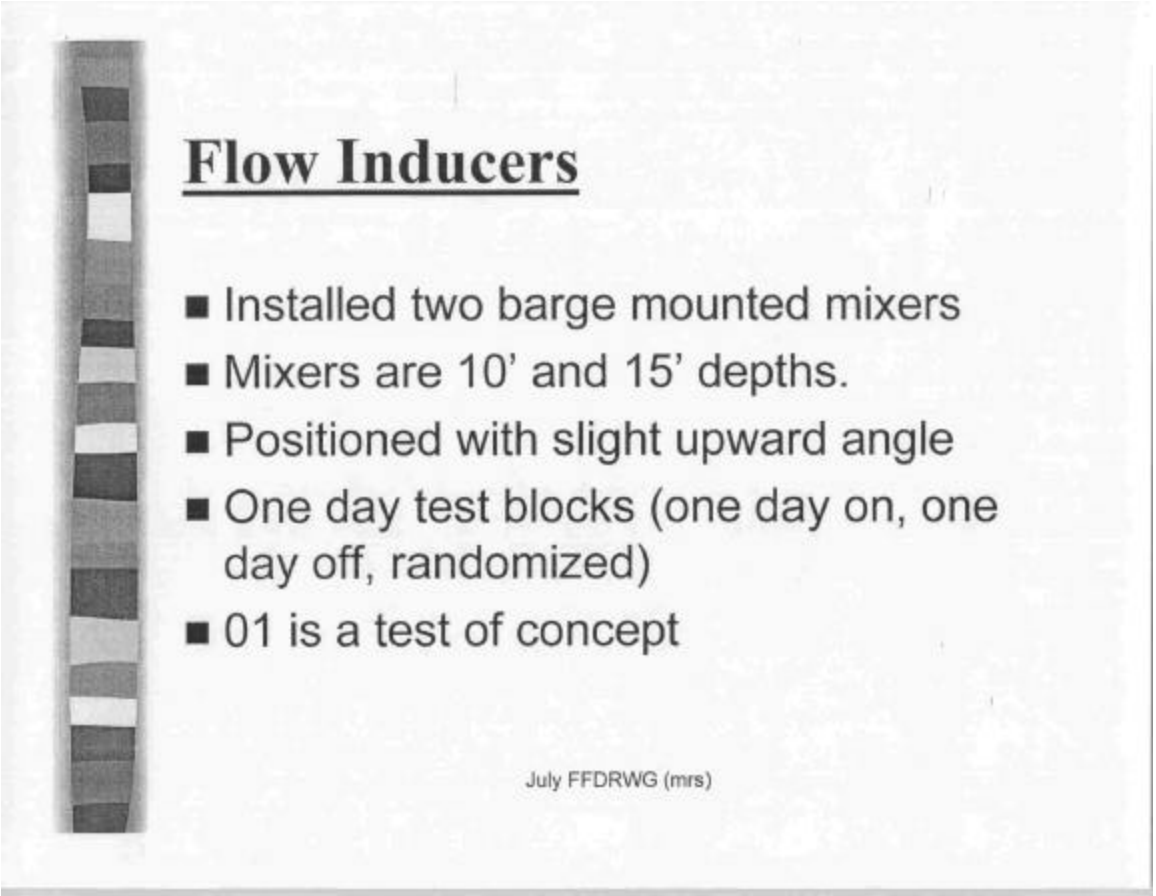
Snake / Clearwater
Year 2000 Temperature
Durations

Location	% Time > 20° C
Snake @ Anatone Gage	35%
Lower Granite Ladder Exit Pool	24%
Lower Granite Ladder D/S Diffuser #14	24%
Lower Granite Ladder Junction Pool	< 1%

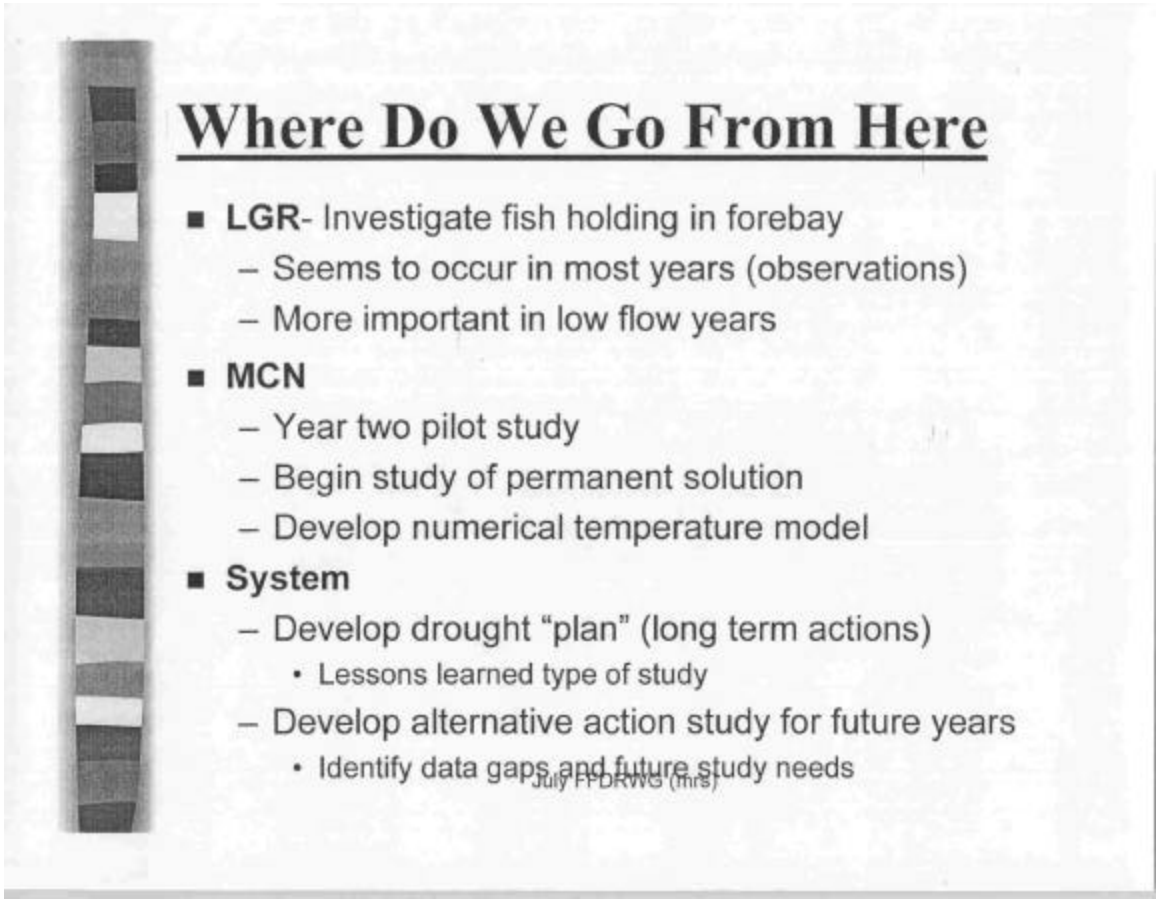
Handout 4
Review of Drought Initiatives
2001 Drought Options



Handout 4
Review of Drought Initiatives
2001 Drought Options (Continued)



Handout 4
Review of Drought Initiatives
2001 Drought Options (Continued)



Handout 5
McNary Juvenile Fish Facility Improvements

5

Fish Facility Design Review Work Group
Walla Walla District
January 24-25, 2001

McNary Fish Facility Improvements –
Bypass PIT Tag Detector and Rerouting of River Release Pipes

PM - Chuck Palmer

Description: Develop construction contract plans and specs for installation of a 36-inch diameter PIT tag detection system on the main transportation flume. Detail required pipes, supports, platforms, personnel access from dedicated stairway and electrical systems. Installation of this PIT-tag detection system allows direct (primary) bypass to the river without having to pass fish through the holding facilities for detection.

Included in this work are plans to reroute and reslope the 10-inch Steelhead and Chinook river release pipes. These pipes have experienced plugging problems in the past. Rerouting them above grade and properly dressing out the new joints will alleviate this problem.

Status: A task order with HDR Engineering (task order 10, task 2a & b.) has been initiated to prepare a Design Documentation Report (DDR) that will develop location and design for the PIT tag system and preliminary reroutings and slopes for the Steelhead and Chinook river release pipes.

- PIT tag report is complete and has had the final submittal reviewed. The review generated some very good comments which will be incorporated into the design.
- PIT tag design is presently at 65% complete.
- Final submittal on the Steelhead and Chinook river release lines from HDR is still pending. HDR now plans to submit the final report, hydraulic grades, and cost estimates around the 17th of Aug. The preferred solution is option #13 as detailed in the Jan 2001 30% report. This option reroutes the Steelhead line out over the river along the retaining wall and reslopes the Chinook line beginning in the area just before it passes over the sluiceway. Pipe type option is HDPE with internal weld beads ground smooth.
- Rerouting and reslope of river release pipe design is presently at 40% complete.

Schedule:

60% design	**July 2001**	mail drawings for review
BCOE Review	**21 Aug 2001**	comments due to COE (C. Palmer)
Advertise	**18 Sept 2001**	

Handout 6
McNary Adult Collection channel Fallback

(6)

Fish Facility Design Review Work Group
Walla Walla District
July 24-25, 2001

McNary Adult Fallback - Collection Channel

PM – Chuck Palmer

Description: Periodically adult salmon and steelhead fall-back through the turbine intakes and into the juvenile collection system. There is concern that the adult fish are trapped and delayed in the juvenile collection channel and system. Radio tag studies are currently being performed to verify these conditions and determine the need to implement required collection channel egress systems.

Status: A task order with HDR Engineering (task order 10, task 1.) has been initiated to prepare a report that will describe the problem, detail the approaches used to reduce the impacts, and list advantages/disadvantages of each solution. The report will consider the effects on juvenile salmon and steelhead that may also be present in the system, the desired outcome for the adults, and potential for fish injuries (adult and juvenile). In addition, operational and maintenance constraints, potential for debris to foul the system or interfere with the operations, and a list of risks and potential failure modes that may exist will be identified for each concept.

HDR is running behind the schedule previously presented. They're planning on submitting the 100% report towards the end of July. The preferred plan is to employ an Alaska steep-pass ladder, false weir, and discharge pipe that allows adults volitional travel from the Juvenile Collection Channel to the tailrace. The report will address two alternatives for the adult return discharge locations along with associated cost estimates. Both locations considered are in the tailrace. One location is out over the lower powerhouse deck and the second alternative is north of this location. Moving it north improves accessibility to areas frequented by project personnel but is looking to be a significant increase in the cost estimate.

Summary

- Continuing with adult radio tag studies to determine project need
- 100% Report due end of July
- Planning design, construct, and test of a prototype system in fy02 depending on study results

Schedule:

July FFDRWG	**24-25 July 2001**	status report
100% report	**July 2001**	mail review packages
100% review	**31 Aug 2001**	comments due to COE (C. Palmer)
Final report	**Sept 2001**	final report -recommended alternative

Handout 7
RSW Update

1A

Fish Facility Design Review Work Group
Walla Walla District
July 25, 2001

McNary Perforated Plate Replacement Contract

Status: Done – contract completed

Goose-Granite Perforated Plate Replacement Contract

Status: Done – contract completed

Lower Granite SBC Modifications for 2001

Description: Goebel Construction

Status: Completed

Lower Granite Removable Spillway Weir

Status: The RSW was delivered to Lower Granite on 18 June. Installation started on 20 June, as originally scheduled. However damage to the RSW that occurred on 24 June during initial installation efforts. The RSW spillway seal contacted the dam spillway pier nose, causing damage to the RSW "seal" and a seal plate. Both have been repaired. However, other modifications to the RSW were made to make the ballasting process safer for the contractor, including adding several internal vents inside the RSW ballast tanks.

Due to the damage, repairs, and subsequent modifications, the original completion on 11 July could not be met. The activities necessary to complete the RSW have been coordinated with the NMFS, and a new completion date of 15 August is scheduled.

Schedule:
Week of 16 July: Complete interior modifications for vent (limbering for installation)
Week of 23 July: Finish weld (hinge beam), rotate RSW and bolt to hinge supports.
Week of 30 July: Set and grout bearing pads, cure, then rotate RSW slightly upstream.
Week of 6 August: PLC commissioning Rotate RSW (down). Install/grout seal channels. raise RSW to upright position, secure latches.
Week of 13 August: Complete handrails/touch up paint, final punch list.
August 15: Complete RSW contract efforts.
September (TBD): Hydraulic test (Lynn Reese discussion)
Oct/Nov (TBD): Initial Biological Test (Tim Wik discussion/coordination)
Winter 01 – 02: RSW modifications (if determined necessary)
Spring 02: Biological Tests (to be coordinated)

Handout 8
McNary Adult Pit Tag Detection

2A

Fish Facility Design Review Work Group
Walla Walla District
July 25, 2001

McNary Adult PIT Tag

Status: In-Water Testing completed at Oregon Ladder, with favorable results. EMI/RFI survey performed at Washington Ladder. Both sites provided favorable data. A/E has initiated plans and specifications.

Schedule:

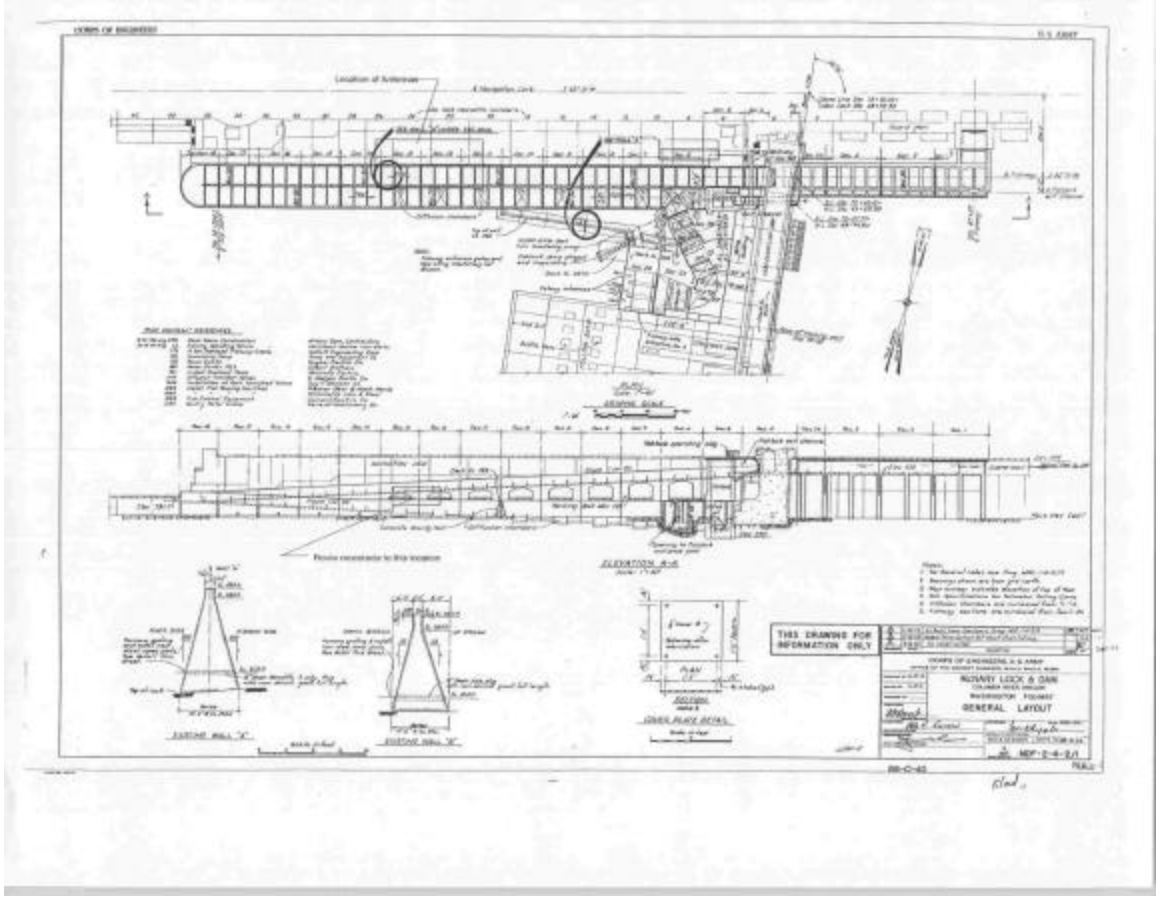
- ⇨ Initiate P&S A/E ..... June 2001
- ⇨ Plans and Specifications Complete ..... September 2001
- ⇨ Advertise ..... September 2001
- ⇨ Open Bids ..... October 2001
- ⇨ Start Construction ..... November 2001
- ⇨ Complete Construction ..... March 2002

Issues: Three-phase acquisition of materials. (1) Purchase order of NEMA enclosures, (2) Purchase Order for Electronics Building Furnish and Install (3) MATOC for Construction/modification of weirs for antenna installation.

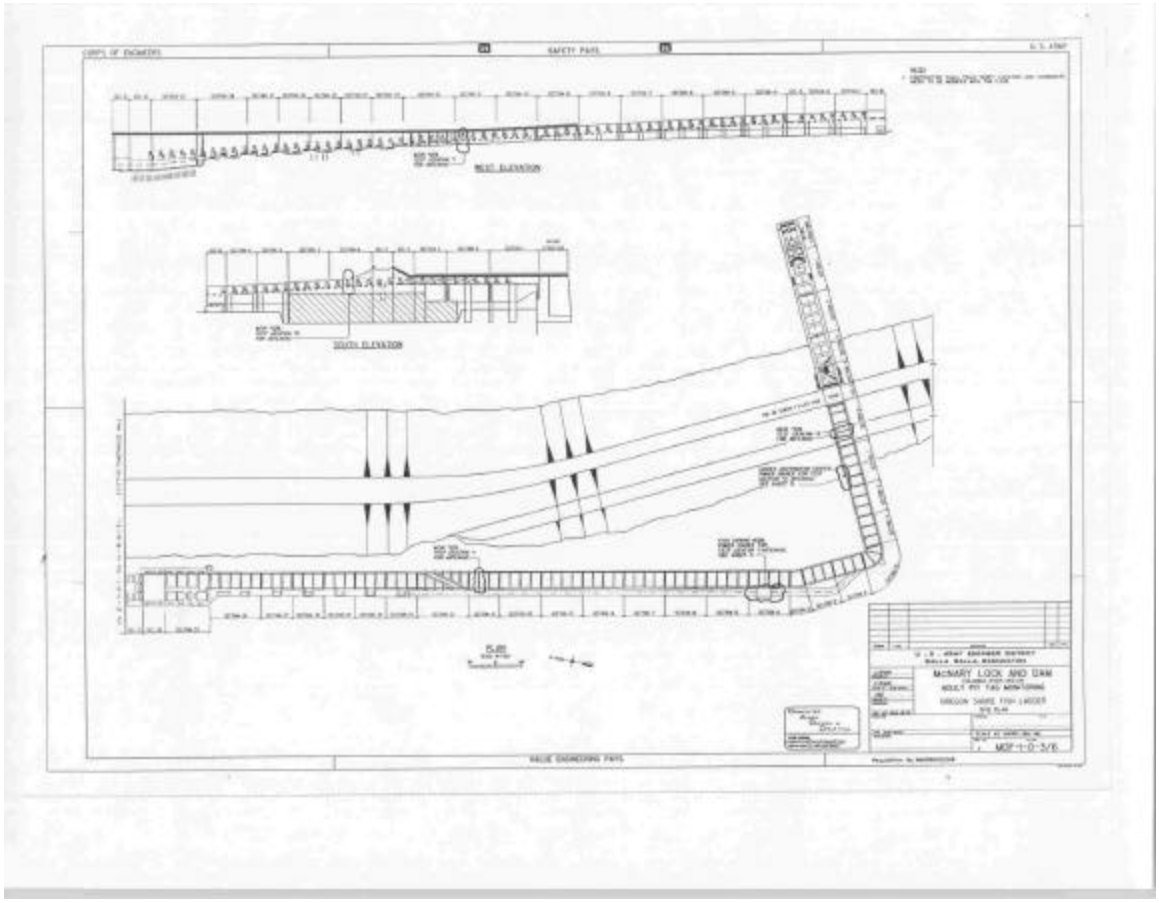
Electronics Buildings will be completed prior to the antenna installation to facilitate testing.

Budget Estimate: $1.75M (Includes BPA funding antennas)

Handout 8
McNary Adult Pit Tag Detection (Continued)



Handout 8
McNary Adult Pit Tag Detection



Handout 8
Ice Harbor Emergency Auxiliary Water Supply

Fish Facility Design Review Work Group
Walla Walla District
July 25, 2001

Ice Harbor Emergency Auxiliary Water Supply

Status: Contractor McClure and Sons, Inc. Award date 15 May 01.
Submittal Process for Pumps, Derrick and Bridge Cranes

Schedule

- ⇨ Current Schedule ..... August 2001- March 2005

Contractor is proposing a compressed schedule

- ⇨ Phase 1 - Install Pump #1 ..... Jan-Feb 2002
- ⇨ Phase 2 - Install Pump #2 ..... Jan-Feb 2003
- ⇨ Phase 2 - Install Pump #3 ..... Mar-Apr 2003
- ⇨ Phase 3 - Construction on South Shore ..... Jan-Feb 2004
- ⇨ Complete Construction ..... March 2004

Issues: COE has yet to receive an approved construction schedule. Under the Contractor's proposed schedule, at the end of Feb 2003 construction, the Project will have 2 pumps capable of operating the fishway under current criteria. Installation of the 3rd pump immediately following (Mar-Apr) will provide the 1 pump redundancy. Risk is during the March-April installation of the 3rd pump, there will be no backup in the event of a failure of one of the new pumps. The original pump if left in place for the season will not provide sufficient pump capacity to meet criteria in the event of a failure.

Potential savings due to one less construction year, mobilization and demobilization cost saved, and escalation costs associated with out year procurement of other resources.

Request buy-in from all Agencies to the compressed schedule.

Contract Award Amount: $5, 601,941 ($5.64M original)

Handout 8
Lower Monumental Emergency Auxiliary Water Supply

Fish Facility Design Review Work Group
Walla Walla District
July 25, 2001

Lower Monumental Emergency Auxiliary Water Supply

Status: Completed 100% report on feasibility of utilizing JBS surplus water to power a new AWS turbine. Turbine Pump Test Report was initiated to verify current pumping capacity, currently at 90%. Pump Testing confirmed that the AWS system was operating at a 6' discharge head, not the 4' head the pumps were designed for. Numeric hydraulic computer model of the adult fishway system is complete, training of system provided by NHC on 24 July. Numeric model utilized for additional pump testing AWS alterations. The AWS was reconfigured and operated at 4' of head in the discharge chamber, with only 2 of the 3 pumps running. A review meeting was held in the Walla Walla Walla District to discuss pump test findings and direct action for completion of the letter report. The A/E reduced the number of alternatives that will be investigated as viable approaches to provide emergency water from 26 to 6. Technical report on the 6 alternatives to be completed 2nd quarter FY02.

Schedule:

- ⇨ Initiate Report: INCA/RW Beck AE contract..... December 2000
- ⇨ Computer Model Developed..... April 2001
- ⇨ Computer Model Simulations Completed ..... July 2001
- ⇨ 100% Letter Report Completed ..... July 2001
- ⇨ 100% Technical Report Completed..... November 2001
- ⇨ Initiate P&S (depending on funds and priorities) ..... December 2001
- ⇨ Advertise..... April 2002
- ⇨ Open Bids ..... May 2002
- ⇨ Start Construction..... July 2002
- ⇨ Complete Construction..... March 2003

Issues: Lead-time on equipment, depending on alternative chosen may delay construction 1 year. Feasibility of large-scale excavation or soil and bedrock adjacent to existing powerhouse facilities reduces attractiveness of JBS discharge system. Fail-safe operation of discharge water in the event of turbine problems, to preclude adverse affects on juvenile fish passage, and possible flooding of by-pass facility.

Budget Estimate: $6.6M

Handout 8
Little Goose Emergency Auxiliary Water Supply

Fish Facility Design Review Work Group
Walla Walla District
July 25, 2001

Little Goose Emergency Auxiliary Water Supply

Status: Plans and Specifications at 60%. Draft Reports completed for the Hydraulic Evaluation and the Pump Test of the Adult Fishway System. Fishway System Drawing at 90%.

Project was suspended for 2 months pending reprogramming of funds.

Schedule:

- ⇨ Initiate P&S JE/Sverdrup ..... December 2000
- ⇨ Computer Model Developed ..... May 2001
- ⇨ Computer Model Simulations Completed ..... July 2001
- ⇨ VE Study Completed ..... January 2001
- ⇨ 60% Plans and Specifications ..... June 2001
- ⇨ Plans and Specifications Complete ..... August 2001
- ⇨ Advertise ..... December 2001
- ⇨ Open Bids ..... March 2002
- ⇨ Start Construction ..... June 2002
- ⇨ Complete Construction ..... March 2003

Issues: Excavation and shoring requirements for the installation of the new pumps. Major portions of the pump installation will require underwater work.

Budget Estimate: $6.6M

Handout 8
Lower Granite Emergency Auxiliary Water Supply

Fish Facility Design Review Work Group
Walla Walla District
July 25, 2001

Lower Granite Emergency Auxiliary Water Supply

Status: Plans and Specifications completed to the BCOE stage. Lead-time for the Falk gear reducer to replace the Philadelphia is 32 weeks. Lead-time for the electrical switchgear is 12 weeks. Original schedule had the project advertised Fall 2001, for installation in January 2002. Lead times of equipment prohibit acquisition this FY. Construction will be delayed 1 year in order to allow for manufacture of the gear reducer and only require one construction period for the Contractor.

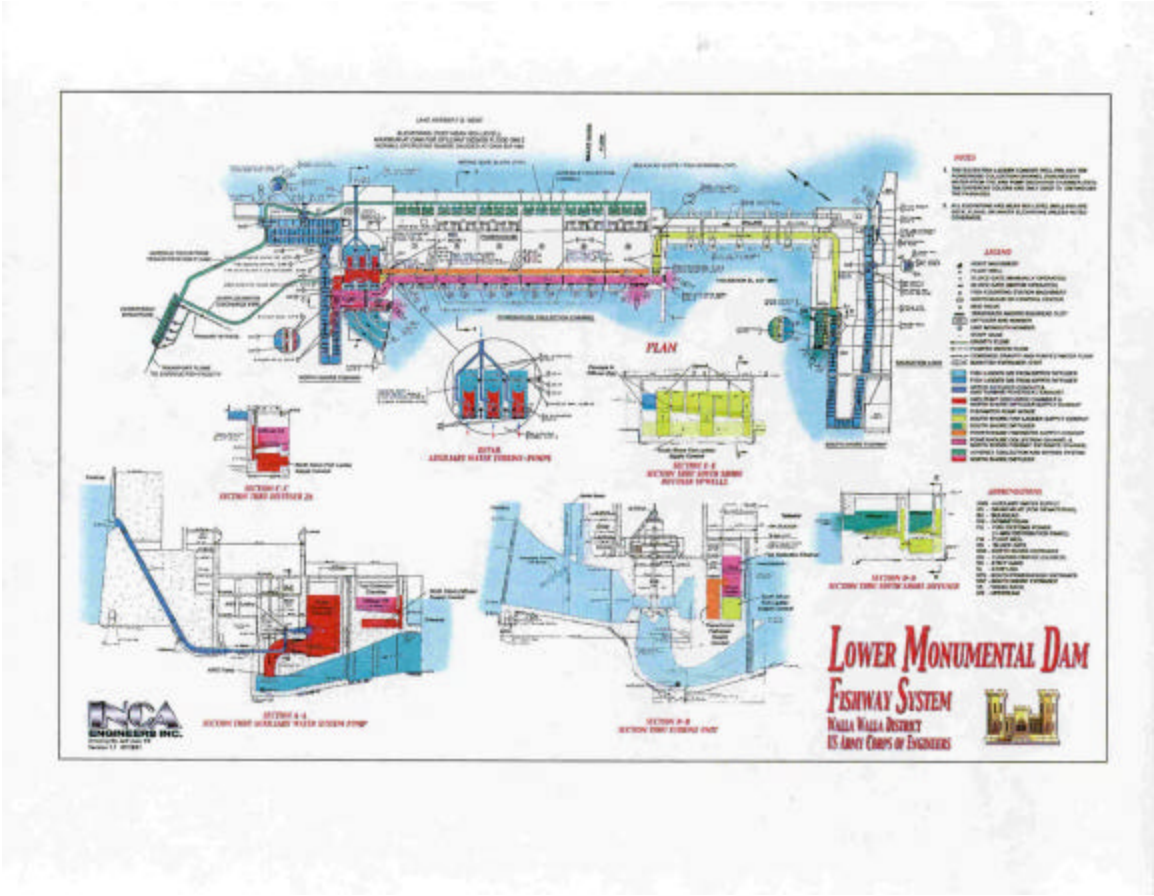
Schedule:

- ⇨ Advertise ..... First Quarter FY 2002
- ⇨ Open Bids ..... January 2002
- ⇨ Start Construction ..... January 2003
- ⇨ Complete Construction ..... March 2003

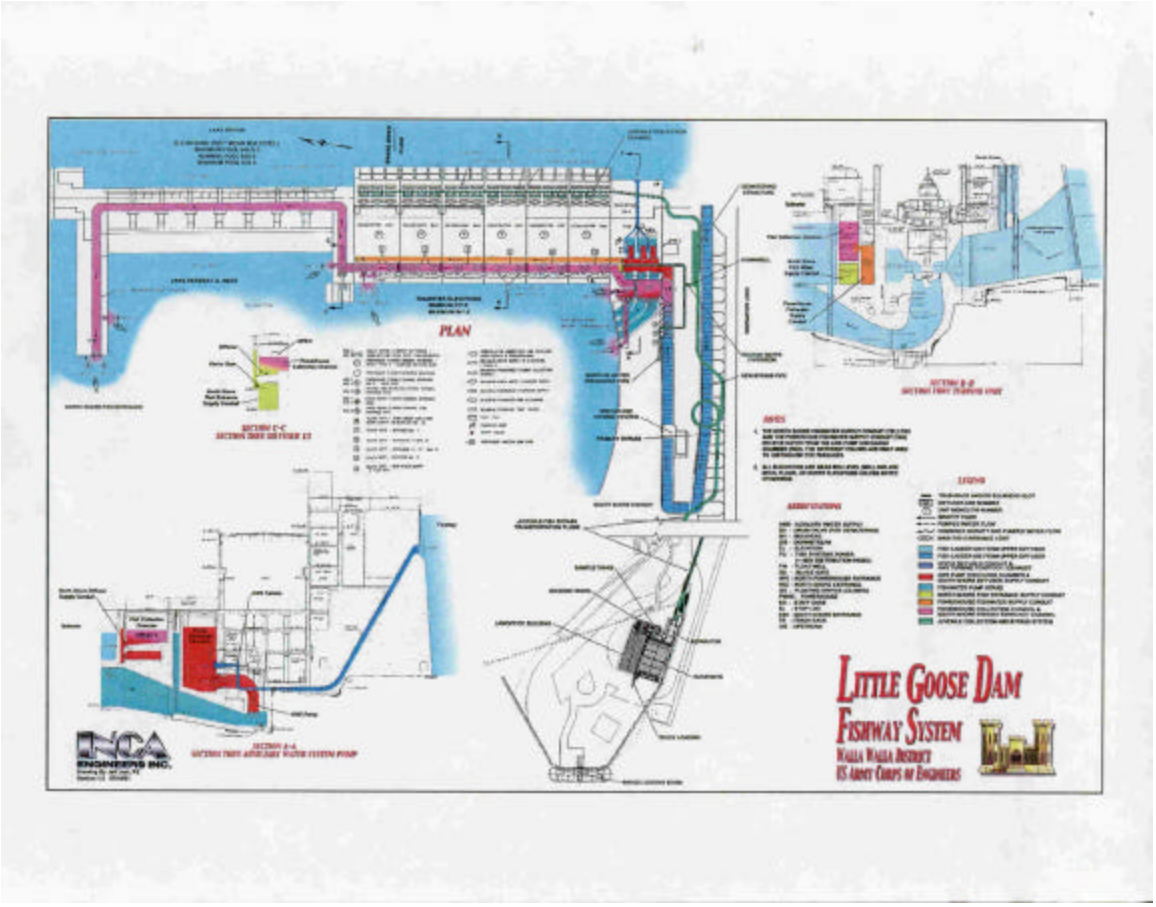
Issues: Coordination of electrical system upgrades with Station Service upgrades performed by HDC. One-year delay will allow for proper coordination of EAWS package with HDC work. Completing work in one construction outage will provide backup pump capacity at all times.

Budget Estimate: $600,000

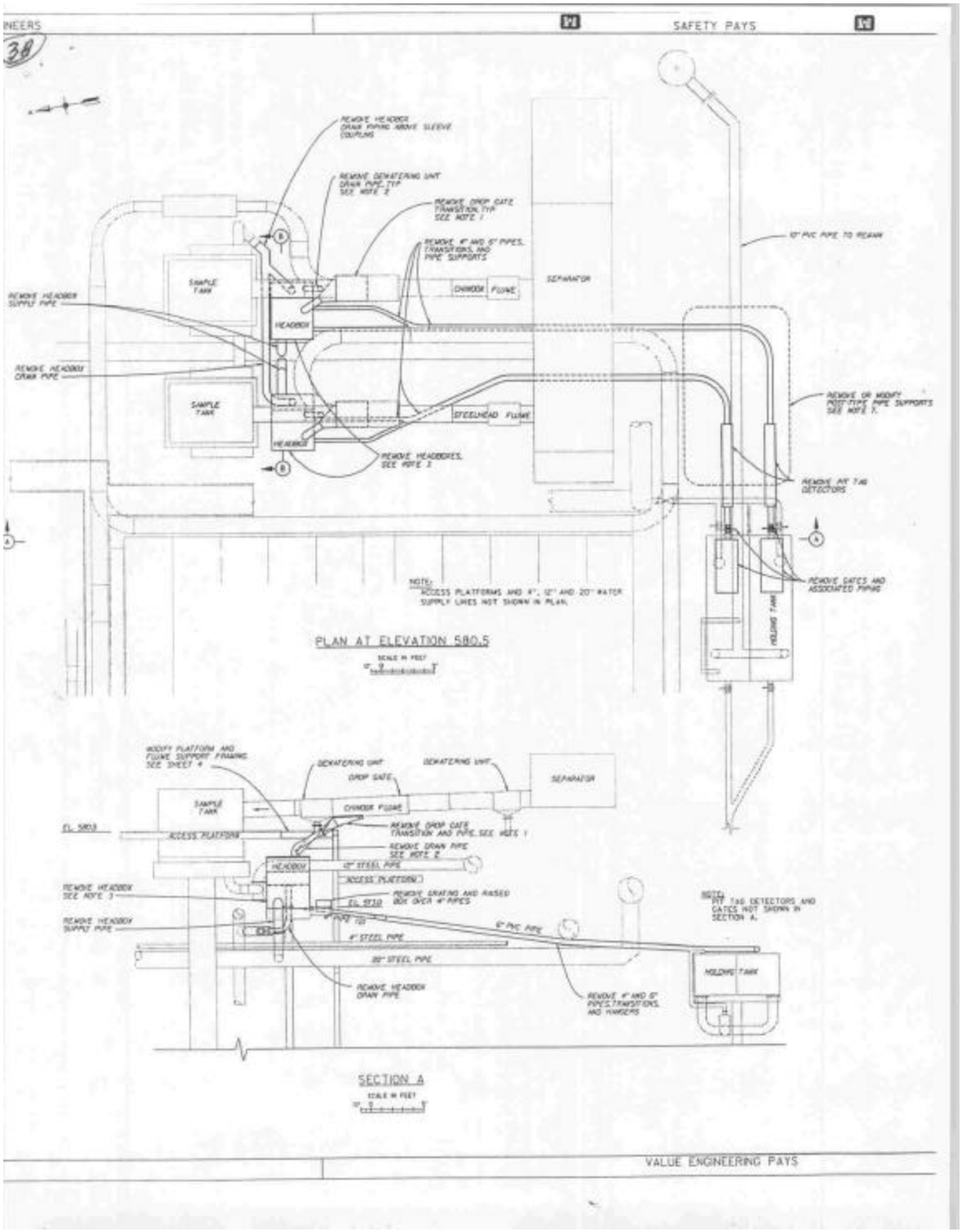
Handout 8
Lower Monumental Dam
Fishway System



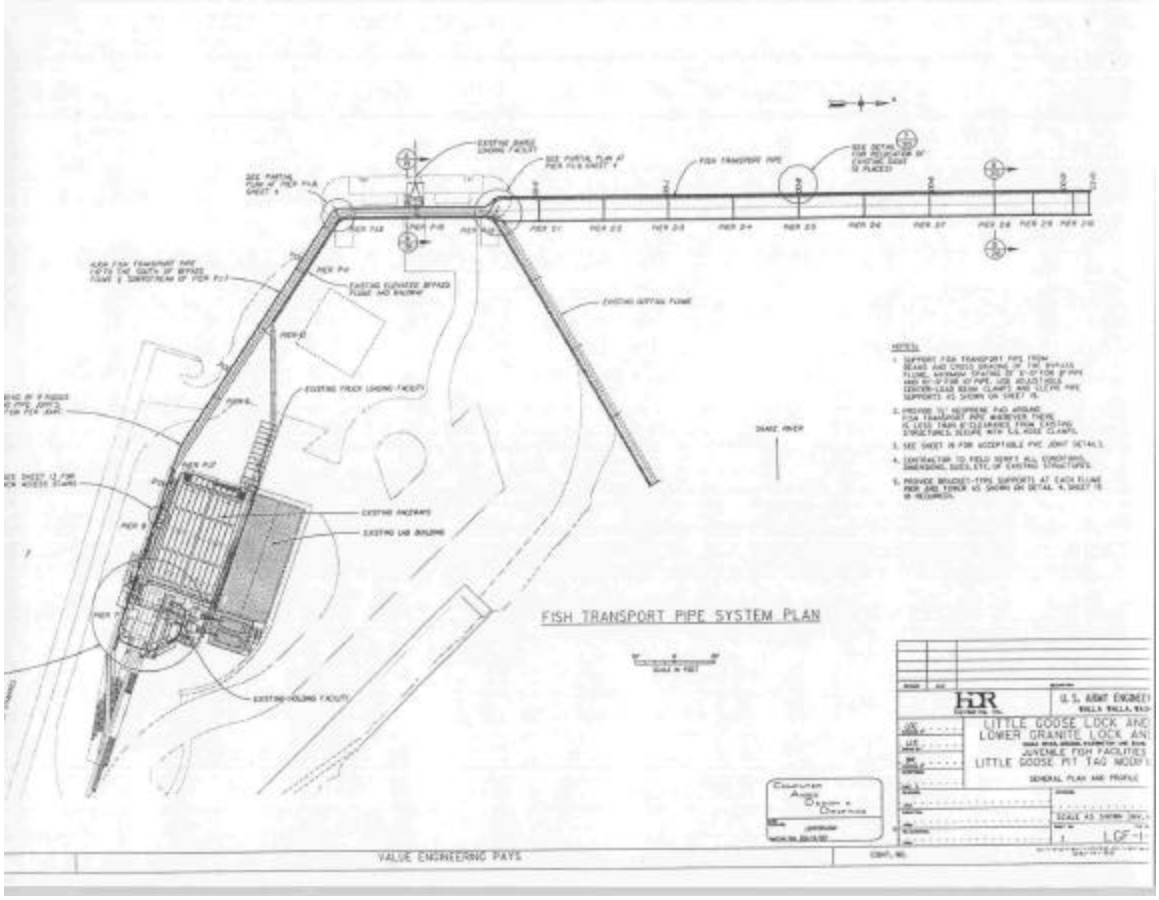
Handout 8
Little Goose Dam
Fishway System



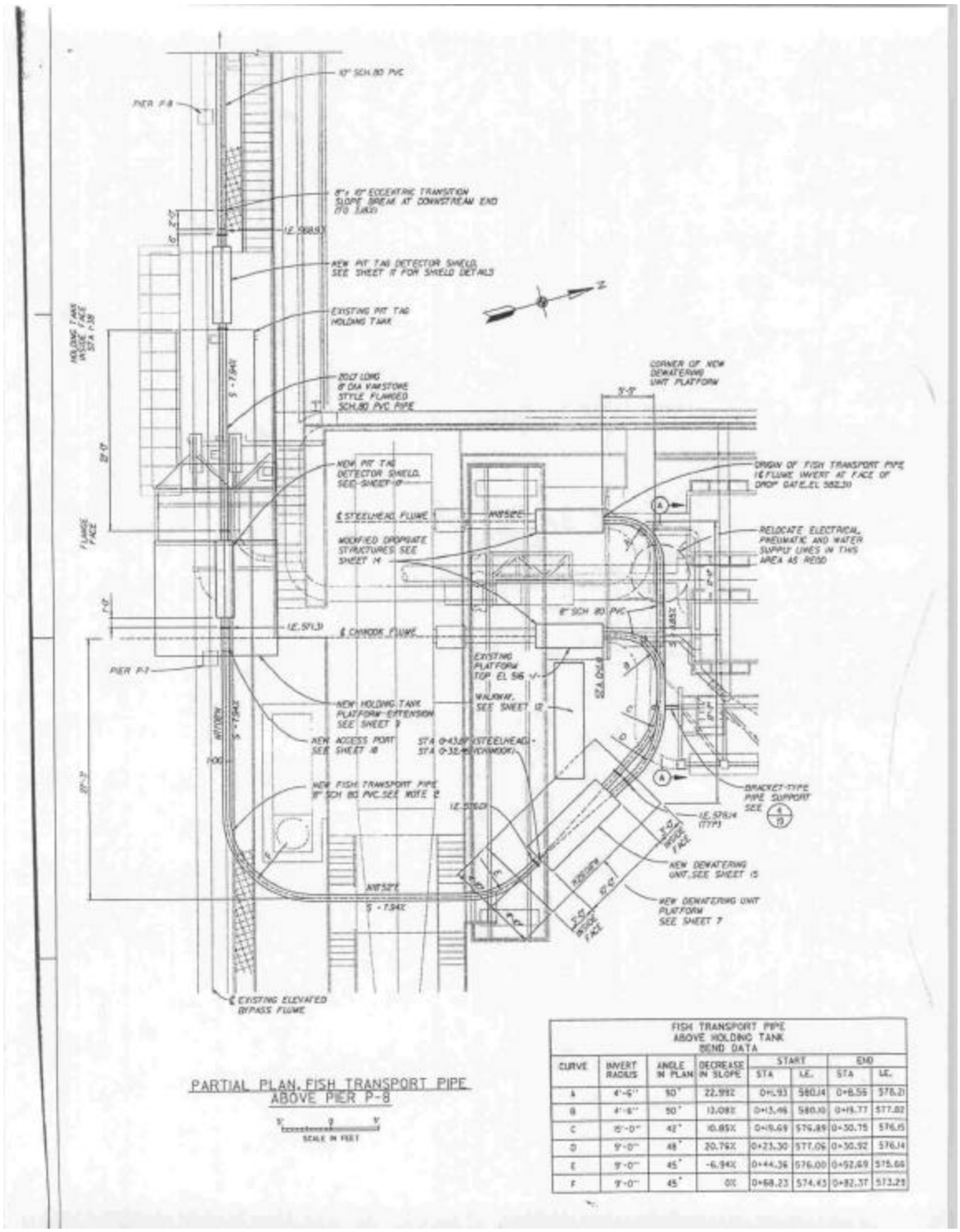
Handout 9
Little Goose Pit Tag Diversion System



Handout 9
Little Goose Pit Tag Diversion System (Continued)



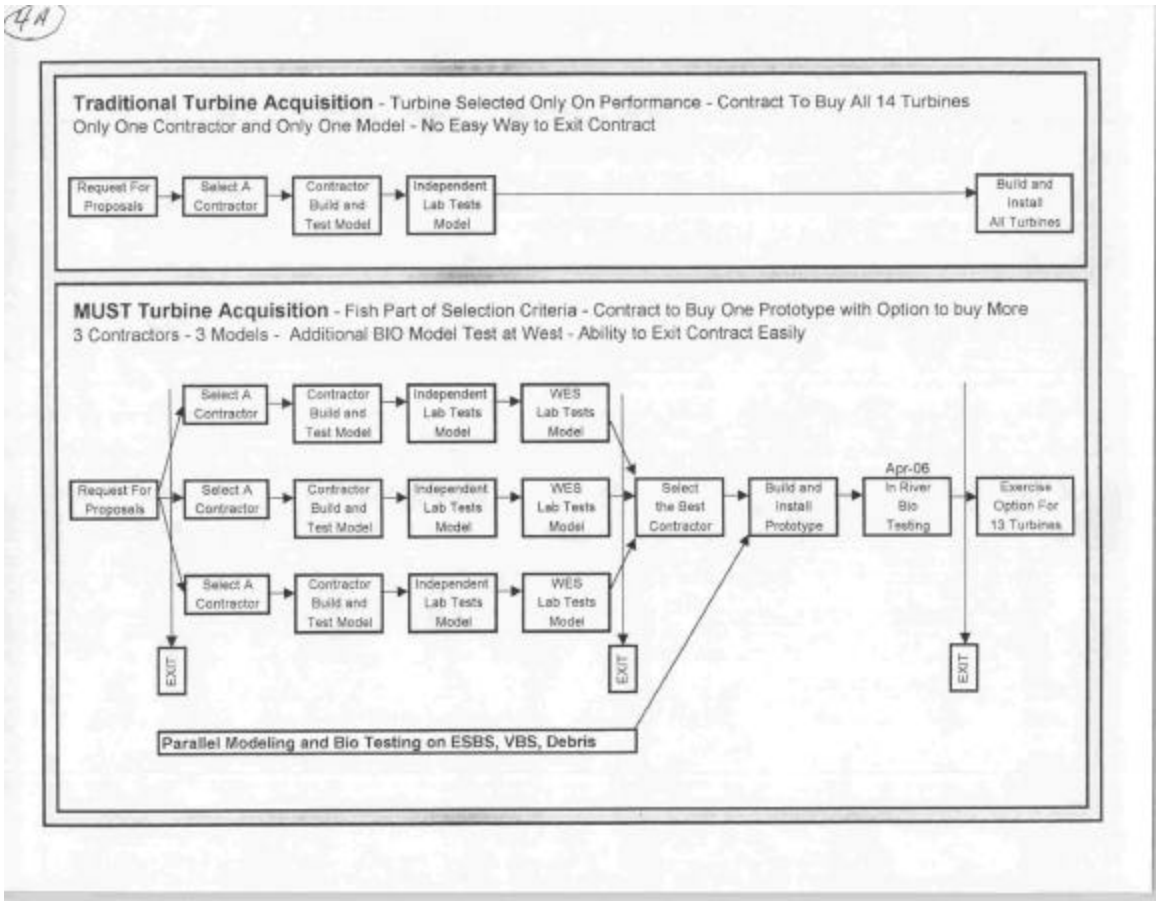
Handout 9
Little Goose Pit Tag Diversion System (Continued)



FISH TRANSPORT PIPE ABOVE HOLDING TANK BEND DATA

CURVE	INVERT RADIUS	ANGLE IN PLAN	DECREASE IN SLOPE	START STA	START I.E.	END STA	END I.E.
A	4'-6"	50°	22.99%	0+11.93	580.14	0+18.56	576.21
B	4'-6"	50°	13.08%	0+13.46	580.10	0+19.77	577.82
C	15'-0"	42°	10.85%	0+19.69	576.89	0+30.75	576.15
D	9'-0"	48°	20.76%	0+23.30	577.06	0+30.92	576.14
E	9'-0"	45°	-6.94%	0+44.36	576.00	0+52.69	575.66
F	9'-0"	45°	0%	0+68.23	574.45	0+82.37	573.29

Handout 10
McNary Turbine Acquisition



Handout 11
McNary Turbine Uprate
Fish Screen Evaluation Study

5A

McNary Turbine UpRate - Fish Screen Evaluation Study
1St Draft - 25 July 2001

1. Research Review
   - Model Investigations
   - Field Investigations
   - Others??

   a. Determination of potential risks – which may include:
      - Poor FPE & OPE
      - De-scaling on ESBS
      - De-scaling / injury in gate well
      - Debris clogging
      - VBS structural integrity
      - Others??

   b. Determination of potential design improvements – which may include:
      - ESBS perforation plates
      - Flow vane
      - Vertical barrier screen re-design
      - Flow control device
      - Head gate operations
      - Others??

2. Physical Hydraulic Model Investigations of Screen System Modifications

   a. Prepare Model Study Scope of Work
   b. Investigations of existing conditions under high flow operations
      - 1:25 turbine model – ESBS performance
      - 1:12 turbine intake model – VBS performance
   c. Determination/Verification of potential design improvements
   d. Investigations of identified design improvements

3. Prepare plans and specifications for recommended Screen System Modifications

4. Prototype Test Phase I - High Q prototype test of Screen System Modifications (Existing turbine, 16,400 cfs)

   a. Develop Prototype test plan for recommended Screen System Modifications
   b. Award Construction Contract for Screen System Modifications
   c. Award Biological Test Contract
   d. Construction/installation of Screen System Modifications
   e. Conduct Biological Test

Handout 12
McNary Turbine Uprate
Fish Screen Evaluation Study (Continued)

5. Re-design pending results

6. Prototype Test Phase II - High Q prototype test of Screen System Modifications (New Prototype Turbine, 18,200) – some or all of the following steps may be necessary
   a. Develop Prototype test plan for Revised Screen System Modifications
   b. Award Construction Contract for Screen System Modifications
   c. Award Biological Test Contract
   d. Construction/installation of Screen System Modifications
   e. Conduct Biological Test

7. Schedule and Costs:

Task	Start	Complete	Costs
Research Review	October 01	November 01	TBD
Model Investigations	January 02	April 02	
Plans and Specs.	April 02	August 02	
Biological test Plan	April 02	August 02	
Advertise & Award Construction Contract	September 02	November 02	
Negotiate & Award Biological Contract	September 02	November 02	
Construction / Installation	December 02	March 03	
Phase IA Bio Test High Q Existing Unit	**March 03**	**July 03**	
Evaluate Test Results	July 03	August 03	
Re-design (if needed)	August 03	October 03	
Negotiate MATOC	October 03	November 03	
Construction / Installation	December 03	March 04	
Phase IB Bio Test High Q Existing Unit	**March 04**	**July 04**	
Evaluate Test Results	July 04	August 04	
Re-design (if needed)	August 04	June 05	
Advertise & Award Construction Contract	July 05	September 05	
Negotiate & Award Biological Contract	September 05	November 05	
Construction / Installation	October 05	January 06	
Phase II Bio Test W/ New Prototype Unit	**February 06**	**July 06**	